An Address

ON

TONE SENSATION WITH REFERENCE TO THE FUNCTION OF THE COCHLEA.

Delivered at the Opening of the Section of Physiology at the Annual Meeting of the British Medical Association at Edinburgh, July, 1898,

BY WILLIAM RUTHERFORD,
M.D. EDIN., F.R.S.,
PROFESSOR OF PHYSIOLOGY, UNIVERSITY OF EDINBURGH; PRESIDENT OF THE SECTION.

GENTLEMEN,—There are few chapters in physiology so interesting as that in which Johannes Müller in his "Elements of Physiology" discusses certain preliminary considerations relating to the general physiology of the senses, and expounds his classical theory of the specific energies—or, as we should now rather say, specific activities—of the sense organs. No doubt we are all agreed that the immediate cause of the specific sensations of the different sense organs must be referred to the different modes of activity developed in the several sensory centres, but how it comes about that the activity of cells in the auditory centre impresses our consciousness with a sense of sound, while that of cells in the vision centre impresses us with a sense of light is, as Müller stated, a "problem incapable of solution."

I am not going to discuss the production of specifically different qualities of sensation, but the production of different qualities of the same kind of sensation. This aspect of the question presented itself to Müller in the early years of this century (1826), as it had done to Newton a century earlier (1704). Although Newton was an opponent of the undulatory theory of light, strange to say he suggested an undulatory theory of nerve action in attempting to explain the production of different colour sensations. He supposed that light induces vibrations in the retina that are transmitted to the brain and there give rise to colour sensations that differ according to the length of the incoming vibrations. In referring to Newton's idea Müller observed that "such a hypothesis if at all tenable would find its first application in accounting for the different sensations of which a single sense is susceptible; for example, in explaining how the sensorium receives the different impressions of red, yellow, and blue and of acute and grave tones," but "that it is only with this application that the hypothesis is worthy of regard."[1] These thoughtful words of Müller were set aside and his theory of specific activities extended to the hypothetical explanation of different qualities of the same kind of sensation, first by Natanson in 1844, then by Helmholtz[2] in 1862, and afterwards by Hermann. The extended theory was so well stated by Hermann[3] in the edition of his "Physiology" published in 1878 that I cannot do better than quote his words: "It is necessary to ascribe to the stimulation of different nerve-fibres the different qualities of any given sensation; for example, the sensations of red and blue, of high and low tones, and hence to suppose that the specific energy of certain fibres aids in the perception of red, while that of others aids the perception of blue, for if it were not so we would be compelled to assume that one and the same nerve-fibre is capable of states of excitement that differ in quality, an assumption hitherto unsupported by facts. There must therefore be at least as many sensory fibres as there are simple qualities of sensation." Although this extension of Müller's theory originated with Natanson its general acceptance and persistent vitality is mainly due to the great influence of Helmholtz.

I had thought that we might perhaps on this occasion discuss the production of different qualities of the same kind of sensation as regards the senses generally, but I became convinced that the subject is too extensive to be taken up at one meeting. I therefore propose to confine myself to the sensations of tone. At the meeting of the British Association held in Birmingham in 1886 I gave a popular evening lecture on the Sense of Hearing in which I proposed a new theory of tone sensation in opposition to the well-known theory of Helmholtz. A short abstract of my lecture appeared in the *Journal of Anatomy and Physiology*[4] at that time, but although my theory has been accepted by a few physiologists, the majority, if I may judge from all the German textbooks and some of those by British and American authors, still adhere to the Helmholtz theory, although there are evident signs that the implicit faith so long prevailing is gradually growing weaker. I deem this a suitable opportunity for submitting my views on this subject to those who have specially studied anatomy and physiology and are able to criticise the opinions I may express. In so doing I must bear in mind that I may be addressing some who are engaged in the practical departments of medicine and who are on that account scarcely so familiar with anatomical and physiological detail as some of us are. I shall therefore endeavour to be as explanatory as may be compatible with brevity in discussing a complicated subject. Although our auditory sensations are highly complex we know that the physical agent by which they are induced is simply the increase and diminution of pressure characteristic of the waves of sound; and happily we now know that in all animals the peripheral mechanism adapted for the reception of sound essentially consists of modified epidermic cells with hair-like processes by which the sound vibrations are transmitted to the cells and the auditory nerve impressed.

STRUCTURE OF THE COCHLEA.

We are all deeply indebted to Gustav Retzius[5] for the splendid illustrations and elaborate descriptions he has given of the structure of the ear. I have found his work of the greatest value in the study of this subject. All are agreed that the cochlear canal, or scala media of the cochlea, is the terminal organ that enables us to appreciate musical sounds. In transverse section the canal is somewhat triangular and is bounded on one side by bone and on two sides by thin membranes—the membrane of Reissner, through which the sound waves enter the canal, and the basilar membrane, through which they leave it. The sound therefore crosses the canal. The basilar membrane supports the organ of Corti; I believe the membrane is nothing but a mere supporting structure, but another function so very different has been ascribed to it that I had better describe its structure minutely. Its main body consists of connective tissue fibres extending from the periosteum covering the osseus spiral lamina to that lining the outer wall of the cochlea. In all cases the chief fibres of the membrane are tense, closely adjacent, and directed across the cochlea. In man and some animals they form a single layer. In the reptile and bird there are two layers of fibres, with a narrow interval between them through which some fibres pass obliquely from the one layer to the other. In the rabbit there are two layers of fibres with connective tissue cells between them. We shall presently see how this complicated arrangement of fibres affects Hensen's theory of the peculiar function he has assigned to them. The fibres are completely covered on both surfaces of the membrane by epithelial cells. Those on the lower or tympanic surface are undifferentiated squamous cells, while those above it are in part differentiated into the organ of Corti.

We can best understand the organ of Corti by comparing its simpler structure in reptiles and birds with its more complex structure in mammals. In the crocodile, as described by Retzius, it consists of hair cells at its free surface, supported by a large number of ordinary columnar epithelial cells planted on the basilar membrane. The fibres of the auditory nerve are distributed to the air cells. Corti's membrane (membrana tectoria) covers the whole organ and the endolymph fills the remainder of the canal. In birds the structure of the Corti's organ is essentially similar to that of reptiles. That fact is of special interest because the power of appreciating musical sounds is so conspicuous in some birds. In mammals the much greater length of the cochlear canal permits of a far larger number of hair cells. Most of the supporting cells are specially modified into the pillar cells of Corti and cells of Deiters, each of them containing a stiff elastic fibre that gives a comparatively firm

[1] Elements of Physiology, Baly's Translation, London, 1842, vol. ii., p. 1072.

[2] Die Lehre von den Ton-Empfindungen, &c., 1862.

[3] Elements of Physiology, translated by Gamgee, second English edition, 1878.

[4] Vol. xxi., p. 166.

[5] Das Gehörorgan der Wirbelthiere, Stockholm, 1884.

support to the lamina reticularis, through which the hairs of Corti's cells project. The hair cells do not reach down to the basilar membrane, but rest on the shoulders of Deiters's cells and inner pillar cells of Corti, by which they are individually supported.

Since Corti's hair cells are the true auditory terminals through which the nerve fibres are impressed their structure is of special importance. Each cell has a thin envelope enclosing a nearly fluid protoplasm with a large nucleus deeply placed near the inner end of the cell and a clear-looking body termed Hensen's corpuscle near its free end. About twenty short, stiff, rod-like hairs project from the free extremity of each cell, their inner ends passing a very short way into the cytoplasm. Nerve fibrils terminate around the inner ends of the hair cells. Retzius was unable to trace them into the cells, but there must at all events be physiological continuity between the cell substance and the nerve. Since the sound waves reach the hair cells through Corti's membrane the nature of that membrane and its relation to the hairs are therefore important. At the apex of the bird's cochlea Corti's membrane has been shown by Retzius to be simply an otolith consisting of a soft organic matrix laden with calcareous particles. But throughout the completely developed portion of the cochleal canal the membrane contains no calcareous matter and is therefore better adapted for the transmission of vibrations. Retzius describes it as "homogeneous and semi-gelatinous" and states that the auditory hairs either project into or are in contact with it. If that be their anatomical relation the membrane and hairs must vibrate as one mass, like the membrane and ossicles of the tympanum. In the mammalian ear Corti's membrane consists of laminæ of homogeneous fibrils. In the cat a hem runs along the lower surface of the membrane next the hair cells. The inner margin of the membrane is firmly attached to the epithelium covering the spinal lamina, while its outer margin is loosely attached to Corti's organ external to the hair cells. The outer attachment is so slender and easily ruptured that the membrane is most commonly detached from Corti's organ in making sections. It is therefore difficult to be certain of the anatomical relation between the membrane and the hairs in the mammal, but probably they are in close relation, so that membrane and hairs may vibrate as one.

STIMULATION OF THE AUDITORY NERVE.

When the sound wave in its phase of condensation arrives in the scala vestibuli it is transmitted through Reissner's membrane to the fluid in the cochlear canal, thence through Corti's membrane, Corti's organ, the basilar membrane, to the fluid in the scala tympani and membrane of the fenestra rotunda. All these parts oscillate back again in the rarefaction phase of the wave. It is admitted that the wave arrives at Corti's organ throughout the whole length of the cochlear canal at practically the same moment. The short, stiff, auditory hairs probably transmit the vibrations of Corti's membrane to Corti's cells in the same manner that they are transmitted by the columella of the bird's tympanum from the membrana tympani to the membrane of the oval fenestra.

What is the precise function of Corti's cells? Do the sound vibrations induce chemical discharges within them that stimulate the nerve ends? If such were their mode of action we may reasonably suppose that they would have required a liberal blood-supply to maintain active chemical change, like the visual terminals in the retina. But, as a matter of fact, there is not a blood capillary in Corti's organ. Its lymph-supply is obtained from capillaries at some distance and its renewal probably takes place slowly. It therefore seems reasonable to dismiss the idea of any special chemical action in Corti's cells and to assume that their action is probably mechanical. Since the terminals of tactile nerves in the cutaneous touch corpuscles are stimulated by pressure without the aid of any intervening cells it is reasonable to suppose that in the ear the sensory apparatus is stimulated mechanically by the alternations of pressure in the sound waves. This view is supported by the observations of Ewald[6] that after complete destruction of the labyrinth and tympanic apparatus on both sides of the head in the pigeon the animal still gives signs of hearing sounds made at a distance, although care is taken to obviate any effect on the nerves of touch. But all signs of hearing disappear if the auditory nerve is destroyed on both sides by the local application of arsenical paste or croton oil. The inference, therefore, is that the fibres of the auditory nerve can be stimulated directly by sound conducted by the bones of the head. But although the auditory nerve detached from its terminals can be stimulated by sound, are we to conclude that Corti's cells are superfluous and that the sound may stimulate the nerve fibres in the organ of Corti directly? We might as well say that touch bodies in the fingers are superfluous because the ulnar nerve can be stimulated by pressure at the elbow. Hair cells appeared as the auditory terminals at so early a stage in the evolution of the animal kingdom that their intervention between the sound vibrations and the nerves must be essential for their proper stimulation. But one cannot tell whether they are simply transmitters of sound vibrations to the nerves or whether the sound vibration, as we know it, is within the protoplasm of Corti's cells translated into that unknown form of molecular vibration termed a nerve impulse.

TONE SENSATIONS.

Our auditory sense excels all others in the power of distinguishing different qualities of sensation. It can distinguish tones varying in pitch from 16 or 20 vibrations to 40,000 or even 60,000 vibrations per second. A good violinist can detect about 50 differences of pitch within the range of a semitone, implying that he can feel a difference due to half a vibration. But in some highly-trained ears the sensitiveness is even greater, so that differences of pitch due to a quarter or even one-sixth of a vibration can be felt throughout the ordinary scale (Luft).[7] How are we enabled to appreciate differences of pitch? As we all know, Helmholtz supposed that the same nerve-cell cannot give us two different sensations even of the pitch of tone and therefore a separate nerve-fibre and cell must be impressed to enable us to hear tones differing by, it may be, only the fraction of a vibration. This was his extension of doctrine of specified activities to explain the different qualities of tone sensation. To render his theory feasible he supposed that the cochlea must contain an immense number of minute resonators capable of severally responding by sympathetic vibration to all the tones we can hear. Each cochlear resonator was supposed to stimulate its own special nerve-fibre and this in turn its own cell in the brain. When he advanced that theory in 1862 the structure of Corti's organ was so imperfectly understood that Corti's pillars were supposed to be the nerve terminals. They increase very slightly in length from base to apex of cochlea (from 0·06 mm. at the base to 0·1 mm. at the apex), yet Helmholtz deemed that small difference sufficient for his theory. But when it was ascertained that no pillars of Corti occur in the bird's cochlea, and that in the mammal they are mere supporting structures apparently unconnected with nerves, the theory of their function as resonators had to be abandoned.

But the resonance theory was not allowed to drop. Hensen came to its support with a new suggestion. He showed that the fibres of the basilar membrane increase slightly in length from base to apex of cochlea and that they may play the part of resonators for tones of widely different pitch, although the shortest fibres are only about ⅓ mm. and the longest about ½ mm. in length. But the fibres are so heavily damped by layers of cells cemented to them on both surfaces of the membrane and along their whole length that they are ill-adapted for resonance. Hensen thought that the basilar fibres run parallel with each other and that they lie in a single layer like piano strings; but in the bird's cochlea there are two layers of fibres and irregular fibres running between them. It is impossible that systems of fibres so arranged can severally act as resonators. A nightingale would scarcely be able to learn its songs if it had to rely on the individual vibration of basilar fibres to enable it to appreciate tones of different pitch. But another argument strikes me as cogent against Hensen's theory. If Corti's membrane had consisted of a single layer of tense parallel fibres, each cemented to the hairs of a series of Corti's cells and varying much in length throughout the cochlea, Helmholtz and Hensen would not have been so unreasonable in ascribing stimulation of Corti's cells to a segmented vibration of the superjacent fibres. But the sound waves first encounter the comparatively lax membrane of Corti and after affecting the hair cells reach

[6] Der Acusticus Stamm ist durch Schall erregbar, Berliner Klinische Wochenschrift, 1890, Band 32, p. 731.

[7] Ueber die Unterschieds-empfindlichkeit für Tonhöhen, Wundts Philosophische Studien, Band iv., p. 511.

the heavily damped subjacent basilar membrane, which is surely in a most unfavourable position for sound analysis.

I have observed in Ziehen's "Physiological Psychology"[8] that Corti's membrane is substituted for the basilar membrane in alluding to Hensen's theory. No one, so far as I know, has ever ascribed a power of sympathetic response to the fibrils of Corti's membrane. It is not a tense membrane; its fibrils are in laminæ and in the bird it is semi-gelatinous. Nor has anyone ascribed to the short rod-like hairs of Corti's cells the power of selective and sympathetic vibration. I believe they are the mere transmitters of all vibrations, whether simple or complex, to Corti's cells. I submit, therefore, that the minute structure of the cochlea places insuperable difficulties in the way of Helmholtz and Hensen's theory and I cannot but think that if Helmholtz had known the structure of the cochlea in mammals, but more especially in birds as described by Retzius, the resonance theory would never have been proposed.

But there is a physical defect in the theory of Helmholtz which he entirely overlooked; for example, if we sound three tuning-forks, giving the notes of a common chord—say C, E, G—each fork produces a simple tone due to a series of simple vibrations. The three sets of vibrations are compounded and enter the cochlea as a compound vibration. But although we have the compound sensation of a harmony we can discriminate its three constituent tones. Helmholtz inferred that the cochlea must analyse the compound vibration and that three sets of terminals and at least three different sensory cells in the brain must be affected. Harmony, however, depends on the relative frequencies of vibrations. It is strictly determined by the mathematical ratios of numbers. In the common chord of C, E, G, the numbers are 264, 330, 396 vibrations per second. Helmholtz never supposed it possible for the cochlear resonators to send these or any such numbers of impulses along their respective nerve-fibres. He abandoned the mathematical cause of harmony at the cochlea and imagined that it could be accounted for by the specific activities of cells in the auditory centre. When he published his book on "Tone Sensations" in 1862 he cannot have been impressed by a passage in Fechner's "Psycho-physics"[9] published two years previously (1860), containing these significant words: "The first, the fundamental, hypothesis is that the activities in our nervous system on which the sensations of light and sound functionally depend are—no less than the light and sound themselves—to be regarded as dependent on vibratory movements."

Helmholtz, in his book on the "Sensations of Tone," gives no evidence that he ever sought to determine how many impulses per second can be transmitted along a nerve; on the contrary, he shows quite clearly that he dismissed the subject without experiment. You can readily verify my statement by examining page 253 of the third edition of his work translated by Ellis and published in 1875.[10] Yet eight years before that edition appeared, his own assistant, Bernstein,[11] had made his researches on the nerve impulse by means of his differential rheotome and had ascertained that the electrical change which accompanies the transmission of a nerve impulse lasts only $\frac{1}{1000}$th of a second (0·0007 second) even when the nerve is powerfully stimulated. Therefore, even when tested in that manner 1400 perfectly discrete impulses can be transmitted per second in a frog's sciatic nerve. But Bernstein's method of experiment, though highly ingenious, is far too crude to inform us of the limit to the frequency of the impulses that a nerve is capable of transmitting. The question is, if a nerve can transmit, say, 1400 perfectly discrete impulses per second, is there any reason why it should be supposed incapable of transmitting 14,000 or even 40,000 per second to produce the highest audible tones? I imagine that if Bernstein had made his experiments before Helmholtz published the first edition of his book he could not have abandoned the mathematical cause of harmony at the cochlea, but must have believed that the vibrations produced by the several tones of a chord are continued into the brain. I believe he would have adopted this view of the matter even though he adhered to his theory of cochlear analysis.

[8] Leitfaden der Physiologischen Psychologie, third edition, Jena, 1896, p. 75.

[9] Element der Psychophysik. 1860. Second edition, 1889, Part ii., p. 282.

[10] On the Sensations of Tone, &c., translated from the third German edition by Ellis, London, 1875.

[11] Über den zeitlichen Verlauf der negativen Schwankung des Nerven Stroms, Pflüger's Archiv, 1868, Band i., p. 173.

THEORY OF HEARING SUGGESTED BY THE TELEPHONE.

Eighteen years ago (1880), while thinking over the great difficulties that beset the resonance theory, it occurred to me that the telephone might by analogy help us to better understand the action of the cochlea. The telephone transforms sound vibrations, however complex, into electrical currents of corresponding frequency, amplitude, and wave form, and these in turn are re-transformed into sound vibrations similar to those received. The theory of hearing which I was led to propose is that there may be no analysis of sound in the cochlea; that all the hair cells may be affected by every sound, simple or complex, and through them the sound waves translated into nerve vibrations of corresponding frequency, amplitude, and wave form; that in the sensorium the nerve vibrations give rise to sensations varying in quality with that of the incoming impulses. My theory has been termed the telephone theory of hearing, and no doubt it is a convenient term to distinguish it from the resonance theory, but I wish it to be understood that I never regarded the hair cells as transforming the mechanical vibrations of sound into an entirely different mode of motion analogous to electricity. The essential point in my theory is simply this, that there is no analysis of sound waves in the cochlea. Theoretically a single hair cell, nerve fibre, and sensory cell should suffice to give us all the different sound sensations; but probably the great number of auditory terminals and sensory cells renders us far better able to feel slight differences in the quality of sounds. My theory of tone sensation has the advantage of carrying the physical cause of harmony into the auditory centre, and the validity of the argument I advanced in 1886 was afterwards proved by Hermann by experiments on the production of differential tones.[12] When two discordant tones are simultaneously produced a beat is heard, and if the vibrational difference between the two primary tones be sufficiently great the successive beats give rise to the sensation of a third tone whose pitch is the vibrational difference between the two primary tones; for example, if the primary tones have respectively 880 and 1056 simple vibrations—namely, notes A^1 and C^2—the pitch of the beat tone is 176 simple vibrations—namely, the note F.

Hermann produced the two primary tones from two tuning-forks, with a third fork at rest, but capable of consonating to the beat-note if it had been produced objectively, but the third fork remained unaffected, although the observer heard the beat-tone loudly. He therefore concluded that if the beat-tone failed to excite a resonator outside the ear it could not affect any supposed resonator in the cochlea; consequently it must be a purely subjective phenomenon arising from the conflict of vibrations in the auditory centre. That experiment, which has been fully confirmed, proves that the auditory nerve transmits to the sensorium vibrations of the same frequency as the sound waves and that they produce in the auditory centre harmony or discord, according to their relative numbers. Hermann's conclusion from these experiments is "that there is no alternative but to drop the Helmholtz hypothesis of resonators in the ear, although so elegant."

Although the telephone theory of the action of the cochlea enables us to understand the production of sensations of harmony and discord it still leaves much that is in the highest degree obscure. The discrimination of pitch is a great difficulty. We all know that it varies greatly in different persons. Those who have little or no ear for music have been found unable to observe any difference of pitch between C and E of the scale, although there is an interval of 66 vibrations between them. On the other hand, a musician with an extremely good ear may by practice become so sensitive to pitch that he can detect a difference due to one-fifth of a vibration even when the vibrational frequency is 1000 per second. That fact is all the more remarkable, because when the vibrational frequency rises above 500 per second we cannot detect the individual vibrations, although we can readily feel a change in the sensation. The accurate and refined appreciation of pitch seems therefore to imply an exceptionally perfect molecular state in the cells of the auditory centre; but how it is that the consciousness is so sensitive to changes in vibrational frequency when the

[12] Zur Theorie der Combinations-töne, Pflüger's Archiv, 1891, Band xlix., p. 499.

individual vibrations are no longer perceptible must remain a mystery.

Galton's whistle is now frequently used by aurists for testing the upper limit of tone sensation. The pitch of its note can be readily varied by a screw which alters the length of the tube of the instrument by very fine degrees within a range of 12 mm., by which a series of high tones can be obtained with vibrational numbers from nearly 6500 to 84,000, making a range of three and a half octaves above G^4, its lowest note. In using the whistle I find it best to hold it about 2 feet away and somewhat in front of the meatus, for if held too near the puffs of the air produced by squeezing the elastic bag distract the listener during the production of very high tones. In an experiment on three persons with very acute hearing I found that A. heard the pitch of the note rise until the tube was shortened to 1·5 mm., but heard no higher tone. B. could detect changes of pitch until it was shortened to 1·45 mm., but when shortened below 1·4 mm. he heard no tone. C. could detect changes of pitch until the tube was shortened to 1·4 mm., but heard no note when shortened below 1·3 mm. According to the scale accompanying the instrument made by Spiller, London, 56,000 vibrations are produced when the tube is 1·5 mm. in length and at least 60,000 when it is shortened to 1·4 mm. I was surprised at the accuracy with which the listeners detected changes of pitch produced by turning the screw only 0·01 or 0·02 mm. when tones so excessively high were produced. The highest appreciable tone has been stated by Luft to be 41,000 vibrations, but Galton's whistle shows that far higher tones can be accurately distinguished.

Another difficulty is the discrimination of the constituents of complex auditory sensations. How are we enabled to distinguish the several tones of a harmony, since their vibrations are compounded and so arrive at the auditory terminals? Helmholtz believed it impossible to explain our discrimination of the three tones of a chord unless the cochlea analyses the compound vibrations into its three component sets of simple vibrations and transmits their effect to at least three different nerve fibres. But I have argued that the theory of cochlear analysis is attended by insuperable difficulty. It seems to me that we are compelled to entertain the theory that there can be no cochlear analysis and that sound waves, however complex, are translated into nerve vibrations of like complexity which produce in all the cells of the auditory centre a sensory impression that is, so to speak, the representation of the complex vibration. By education and experience we have acquired the power of recognising complex tone impressions such as the vowel sounds without being able to discriminate their components. We all know how laborious it has been for the mathematician to analyse the phonographic curves of the vowel sounds and show what their constituents really are. And we know also that, although our auditory sense has been supposed to have the help of a marvellously perfect instrument of sound analysis in the cochlea, it has not enabled us to discriminate the constituents of the vowel tones, which I think it ought to have done if each constituent tone were, so to speak, ringing up its own nerve cell.

The power of discriminating the components of complex tone sensations such as we receive from an orchestra is, I believe, acquired by practice, and the very fact that it is so difficult to acquire and so rarely acquired to any remarkable degree appears to me opposed to the theory of cochlear analysis and favourable to the theory of tone sensation which I have proposed.

Pressure Pattern Theory of the Action of the Cochlea.

A somewhat different theory of the action of the cochlea was proposed by Dr. Waller[13] in 1891. He is disposed "to regard the basilar membrane as a long narrow drumhead repeating the complex vibrations of the membrana tympani and vibrating in its entire area to all sounds—although more or less in some parts than in others—giving what we may designate as acoustic pressure patterns between the membrana tectoria (Corti's membrane) and the subjacent field of hair cells. In place of an analysis by consonation of particular radial fibres (of the basilar membrane) it may be imagined that varying combinations of sound give varying pressure patterns comparable to the varying retinal images of external objects." I own that I have had great difficulty in seeing how the action of the cochlea is to be explained in Dr. Waller's theory. If the hairs of Corti's cells are to be subjected to different pressures in different parts of the cochlea dependent on the unequal vibration of a tense membrane it seems to me that such a membrane ought to be undamped and placed in contact with the hairs of Corti's cells on the side of the entering sound. But the basilar membrane is heavily damped and is reached by the sound wave only after having traversed Corti's cells. I have already used this argument against Hensen's theory and it seems to me to be no less applicable to that under consideration. But all our theories are open to criticism on a subject so obscure; none of us can say that we have a theory capable of explaining all the facts which have been ascertained regarding the cochlea, and this will become very evident when I have alluded to the results of experiments on animals and pathological observations on man.

[13] Human Physiology, third edition, 1896, p. 474.

Experiments on Animals.

An elaborate series of experiments was performed on dogs by Baginsky[14] of Berlin. His method was to render the animals completely deaf in one ear by destroying the cochlea on that side. He then, in one series of experiments, destroyed the apical portion of the remaining cochlea and in a second series he broke away part of the promontory and destroyed the adjacent portion of the spiral lamina. The inflammatory processes which followed the operation caused many experiments to fail, but in some cases he succeeded in obtaining results that seemed to him reliable. The sensitiveness of the animals to tones of different pitch was tested by air conduction of the tones of pipes. They were completely deaf for some days after the operation, but most of them recovered their hearing to some extent. Their audition was minutely studied for several weeks, after which they were killed and microscopic sections made of the cochlea to determine the extent of the lesion and the condition of the uninjured portion. When he destroyed the apical turn and the greater part of the middle turn of the remaining cochlea the animals after being totally deaf for five or six days gave signs of hearing the very high tones C^4 and C^4. In the course of the second week they were affected by somewhat lower tones, such as C^3, but seldom by C^2, so that they were deaf to all the tones of a bass voice and all the chest notes of an ordinary tenor voice. The necropsy showed that in these animals the basal portion of the cochlea was apparently uninjured and Baginsky's conclusion is that the basal turn of the cochlea is devoted to the audition of the very high tones which lie quite above the ordinary scale, while the apical and middle turns enable the dog to hear all the ordinary and the deeper tones of the voice, thus supporting the theory of Helmholtz.

The cochlea can be reached far more easily in the guinea-pig than in the dog and experiments on that animal have been made by Corradi[15] and also by Stepanow.[16] Both observers took the reflex movement of the outer ear as an index of hearing. According to Corradi destruction of the apical portion of both cochleæ abolishes all response to deep tones, but the animal is still affected by high tones. His results, therefore, agree with Baginsky's; Stepanow, however, obtained entirely different results. In a large number of guinea-pigs he destroyed the apical portion of both cochleæ. Although many experiments failed owing to permanent deafness or other cause he had seven successful cases in which low as well as high tones caused the animal to move its ears. He found no evidence that the animals failed to hear tones of low pitch. Stepanow's results are therefore a complete contradiction of those obtained by Corradi on the guinea-pig and by Baginsky on the dog, and we shall see that Stepanow's conclusions are borne out by his observations on man. Baginsky[14] also made experiments on the basal portion of the dog's cochlea, but with results so uncertain that he would have done well to have deduced no conclusions from them. The anatomical conditions are such as might well render any such experiments futile. He desired to open the scala tympani in the basal turn of the cochlea and destroy the membranous spiral lamina there without permanently interfering with transmission of sound to the apical portion. After completely destroying the cochlea of one ear and injuring the basal portion of spiral lamina of the other many of the animals remained permanently deaf. Of those

[14] Zur Physiologie der Gehörschnecke, Sitzungsberichte der Akademie der Wissenschaften, Berlin, 1883, Band xxviii., p. 685.

[15] Über die functionelle Wichtigkeit der Schnecke, Archiv für Ohrenheilkunde, 1891, Band xxxii., p. 1.

[16] Experimenteller Beitrag zur Frage über der Function der Schnecke, Monatsschrift für Ohrenheilkunde, Band xxii., 4, p. 85.

that recovered hearing, some appeared to be as much affected by high as by low tones; others seemed less affected by high tones; while in a small number of cases they seemed at first to hear only low tones, but after two or three weeks they were also affected by high tones. In some of these cases he found the membranous spiral lamina completely disorganised at the seat of injury, yet from results so variable and unsatisfactory he concluded that the special function of the basal turn of the cochlea in the dog is to enable it to hear high tones, which is, of course, in accordance with the Helmholtz theory.

PATHOLOGICAL OBSERVATIONS ON MAN.

Observations on tone sensation in speechless animals must always be unsatisfactory; one therefore turns to pathological observations on man in the hope of finding data of greater value, but here also the evidence is contradictory. Stepanow[17] has recorded the case of a young man who had received a severe blow on his left ear which eventually led to exfoliation of the apical portion of the cochlea to the extent of one and a half turns of the tube. When Stepanow became aware of the nature and extent of the exfoliation he perceived that if the Helmholtz theory of tone sensation be true his patient ought to have become deaf in his left ear to tones of low pitch. He had the man's hearing tested in the presence of several colleagues, amongst whom were a physicist and a physiologist, and all were satisfied that the man could hear tones as low with his left ear as with his right ear. Indeed, the appreciation of pitch by his left ear seemed unimpaired. The observers agreed that the case gave no support to the Helmholtz theory as regards the apical portion of the cochlea. Gruber[18] has reported the case of a boy, aged fourteen years, from whose left meatus he removed a sequestrum consisting of the two upper turns of the cochlea. Notwithstanding the loss of so much of the cochlea the tones of tuning-forks, if sounded loudly, were still distinctly heard by air conduction when held near the left meatus. Gruber states that the pitch of the notes made no difference and that the boy could correctly imitate the note. Unfortunately the range of pitch of the tuning-forks used is not stated, so that we have no means of knowing the depth of pitch of the tones heard by the left as compared with the right ear, in which the hearing was normal.

There are, however, other cases by no less eminent observers who regard them as favourable to the Helmholtz theory. A case reported by Moos and Steinbrügge[19] is referred to in the books as showing that extensive nerve atrophy limited to the basal turn of the cochlea is associated with loss of the audition of high tones. I shall not trouble you with the complicated details of that case because the examination of the precise limits of tone sensation in the two ears appears to have been incomplete, and although the deafness to high tones was nearly as great on the one side as on the other the observers examined the cochlea on one side only instead of on both sides for comparison. The books, in referring to this case, assume that the nerve atrophy in the basal turn was the cause of the deafness to high tones; but singularly enough the two eminent aurists whom I have quoted regarded the nerve atrophy as possibly the result of inactivity owing to non-transmission of the vibrations of high tones through the labyrinth, because of the high pressure of the lymph which they were satisfied had been of long standing. In support of this hypothesis they refer to experiments made by Bernett under the direction of Helmholtz, who found that high artificial pressure of fluid in the labyrinth diminishes the transmission of the vibrations of low but more especially of high tones to the membrane of the round fenestra, and that when the pressure is greatly increased the vibrations of high tones are abolished. The possible lowering of the upper limit of tone sensation by increase of intra-labyrinthine pressure must therefore be kept in mind in the study of this subject.

Two important cases have been recently reported by Bezold[20] which appear to have been very carefully observed. One of the cases was that of a woman, aged sixty-five years, whose hearing was defective on both sides. The scale of audible tones was shortened at both ends, the lower tone limit for air conduction was raised to B in each ear, but there was apparently no shortening of the lower end of the scale when the tones were conducted to either ear through the bones of the head. Her upper tone limit was lowered on both sides about two octaves below the highest audible tone of Galton's whistle. The highest note heard by the right ear was given by the whistle at 6·4 mm., by the left ear at 6·3 mm., implying that with both ears she could hear very high notes of from 13,000 to 14,000 vibrations. Three weeks after the aural examination the patient died from pneumonia and the necropsy revealed complete immobility of the foot of the stapes from ossification of the orbicular ligament, which may have accounted for the deafness to low tones by air conduction. Bezold examined the cochlea and found "no nerve-fibres in the spinal lamina near the fenestra rotunda; and in the further course of the first turn there was a moderate increasing atrophy of the nerve-fibres. There was a trace of atrophy even in the second turn. The remaining nerve-fibres stained well with Weigert's method and Corti's organ was well preserved except in the first turn." He concluded that the atrophy of the nerve in the basal turn explained the deafness to the high tones.

Bezold's second case was that of a woman, thirty years of age, whose hearing had long been defective, especially in the left ear, through which she was unable to hear conversation. The sound of a tuning-fork (A^1) placed on the vertex of the head and on either mastoid process was not heard, showing that bone conduction of sound had no apparent effect on the labyrinth and auditory nerve of either side. The range of tone sensation in the left ear was shortened at the lower but especially at the upper end of the scale. She could only hear tones in the middle register extending from D to B^1, a range of nearly two octaves. The sound vibrations that affected her left ear therefore extended from 148 to 990 vibrations and there were no gaps in the scale within that range. On the right side the lower tone limit was C, almost the same as on the left side, but the upper limit reached to 2·2 mm. of Galton's whistle. Her right ear was therefore affected by vibrations varying from 132 to about 38,000. In both right and left ears the scale was shortened at its lower end by about two octaves and the diagnosis was "nerve deafness." The patient was seized with severe illness and died shortly after these observations were made. The left temporal bone was removed and prepared for microscopic examination, but the organ of Corti was not well preserved. The foot of the stapes moved normally. "There was extensive and well-marked nerve atrophy in the basal turn, less marked in the second turn and scarcely noticeable at the apex." Bezold regards the nerve atrophy in the basal turn as the cause of the deafness to high tones, which of course is in accord with the Helmholtz theory. He makes no allusion to the fact that there were no breaks in the scale of audible tones, although there was evident nerve atrophy in the middle turn. He expected to find nerve atrophy in the apical turn to account for deafness to tones at the lower end of the scale, because in this case their defect could not be due to ankylosis of the stapes. Failing to find any definite lesion there he surmised that "possibly there were changes in Corti's organ in the apical turn, which owing to its poor state of preservation escaped notice," or that "there might have been a central lesion to account for the defect in the lower register." He therefore assigned what he regarded as a definite cause for deafness to high tones, no apparent cause for the deafness to low tones, and no defect of tone sensation resulting from the atrophy of fibres in the middle turn. I think it unfortunate that in this case the right cochlea was not examined, since there was deafness to low but not to high tones in the right ear and an examination of its nerve fibres would obviously have been important.

The cases to which I have referred are sufficient to illustrate the great difficulty attending the problem of tone sensation, the mobility of the stapes, the pressure of lymph in the labyrinth, and the state of the sensory nerve apparatus are all capable of affecting our tonal sense. In the first case quoted from Bezold deafness to low tones conducted through the meatus was apparently due to ankylosis of the stapes. I have referred to the effect of high lymph pressure on the transmission of low but more especially of high tones through the labyrinth and the possible production of deafness to these tones from that cause. I have now, in the last place, to ask you to consider the conclusions which appear to be indicated regarding the function of the cochlea in aiding our perception of pitch. I believe I was justified in arguing twelve years ago that our sensations of harmony and discord cannot be reasonably explained unless we believe that the

[17] Stepanow, Zur Frage über die Function der Cochlea, Monatsschrift für Ohrenheilkunde, 1886, p. 116.
[18] Ein Fall von Austossung der oberen zwei Windungen, &c., Monatsschrift für Ohrenheilkunde, Berlin, 1885, p. 225.
[19] Ueber Nervenatrophie in der ersten Schnecken Windung, &c., Zeitschrift für Ohrenheilkunde, 1887, Band x., p. 1.
[20] A Case of Ankylosis of the Stapes and a Case of Nerve Deafness, Archives of Otology, New York, 1894, vol. xxviii., p. 48.

auditory nerve transmits to the brain impulses of the same frequency as the sound vibrations. The proof of that has since been furnished by the experiments of Hermann on differential tones already referred to. But it by no means follows that the theory of cochlear analysis is thereby disproved; on the contrary, it merely compels the upholders of the Helmholtz theory to admit that if certain cochlear terminals are affected by vibrations of a certain frequency they must transmit to the brain impulses of the same frequency as the sound vibrations. Although the validity of my argument on this point be granted it still remains an open question whether certain auditory terminals are impressed by tones of a certain pitch or whether they are all impressed by audible tones of every pitch. If the observations made by Gruber, but especially those by Stepanow, are reliable and free from fallacy we should be obliged to conclude that the loss of the apical half or so of the cochlea does not involve deafness to tones of low pitch. The results of their observations are therefore hostile to the resonance theory and favourable to the telephone theory. On the other hand, the two cases observed by Bezold and that by Moos and Steinbrügge show that deafness to tones of high pitch may be associated with nerve atrophy in the basal turn of the cochlea. It is very difficult to look upon that association as a mere coincidence and apparently more reasonable to regard the basal portion of the cochlea as necessary for the appreciation of tones of high pitch. But if a corresponding relation cannot be shown between the apical portion of the cochlea and tones of low pitch the upholders of the resonance theory must feel that they are supported by only one of the two legs that are necessary in this case.

But if it appear impossible to harmonise the resonance theory of the cochlea with anatomical structure and with certain pathological observations how does it stand with the telephone theory? If it be true, as Gruber and Stepanow would have us believe, that the basal turn of the cochlea can enable us to hear all tones, notwithstanding destruction of the apical half, it seems reasonable to expect that the apical portion should still enable us to hear all tones, notwithstanding nerve atrophy in the basal portion. Bezold's cases, however, appear to show that the basal portion is necessary for the appreciation of high tones. We are therefore landed in the dilemma that pathological observations on the apical portion of the human cochlea are opposed to the resonance theory and favourable to the telephone theory, while those of the basal portion favour the resonance and oppose the telephone theory. In Bezold's second case only about two octaves of audible tones remained in the middle register; the loss of high tones was ascribed to nerve atrophy, but no cause could be assigned for the loss of low tones. On the telephone theory one is compelled to ask why there should have been deafness to many low and so many high tones, although nerve fibres enough remained to enable the patient to hear two octaves of the middle tones. If evidence of high tension in the labyrinth had been recorded in that case an explanation could have been found on the lines of Bernett's experiments, but in absence of that evidence I am bound to say that I do not at present see how that case is to be explained on the telephone theory.

Whatever be the true theory it is important to note that tone defects are far less common at the lower than at the upper end of the scale and that in the middle of it they are exceedingly rare. Politzer states that in cases of apparent tone defects in the middle register the use of resonators generally shows that there is only diminished sensitiveness instead of total deafness to the particular note. At first thought one might be inclined to regard gaps in the scale as evidence in favour of the theory that each auditory fibre is concerned in the sensation of a particular tone, but in the well-known case reported by Magnus, where the tones F, F sharp, G, G sharp, A sharp and B were inaudible, ankylosis of the stapes and calcification of the orbicular ligament were found after death and assigned as the cause.

I think I have said enough to show the difficulty of arriving at a definite conclusion regarding the extension of Müller's doctrine of specific activities to the several fibres of the cochlear nerve. The writing of this address has been to me a grateful task, for it has compelled me to see the strength and the weakness of the theories hitherto advanced in explanation of the function of the cochlea. The study of theories stimulates thought and I trust that my necessarily rapid and imperfect sketch of a complicated subject may serve to induce discussion of the difficult problem of the qualities of tone sensation.

ON THE

OCCURRENCE OF CARTILAGINOUS AND BONY NODULES IN THE TONSIL.

BY HUGH WALSHAM, M.A., M.D. CANTAB., M.R.C.P. LOND.,

ASSISTANT PHYSICIAN (FORMERLY PATHOLOGIST) TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST; CLINICAL ASSISTANT TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

WHILE making some observations on the occurrence of tubercle in the tonsil other interesting points connected with their histological structure came under my observation, such as the number and distribution of the tonsillar crypts, the varying amount of adenoid tissue, and the gradual disappearance of the closed lymphatic follicles with advancing life; the occurrence of the so-called epithelial pearls so well described by Professor Kanthack[1] and their relation to the formation of the tonsil calculi, &c. But in two instances examined by myself the microscopical structure of these organs was so peculiar that I venture to regard them worthy of record, especially as I am unable to find any description of such a condition in medical literature, at least in this country.

The first case which came under my observation was that of a man, aged fifty years, who died from acute pulmonary

FIG. 1.

From the man aged twenty-seven years. It shows well one of the cartilaginous masses in the adenoid tissue of the tonsil.

tuberculosis in the City of London Hospital for Diseases of the Chest. The post-mortem examination was made on Oct. 3rd, 1895. Both tonsils had undergone considerable atrophy or perhaps may more properly be said to have retained their infantile conformation. The tonsillar crypts were extremely few and wide. The squamous epithelium lining the crypts was normal. The closed lymphatic follicles had for the most part disappeared, but this is perhaps only a senile change described by Retterer.[2] Scattered throughout the organ, at the base of the crypts, were numerous small masses of bone in the form of trabeculæ, rings, and solid nodules. These nodules and trabeculæ of bone did not encroach on the proper adenoid tissue of the organ. They were just discernible with an ordinary pocket lens in the stained section as small yellow nodules. In one section a small cartilaginous nodule was still to be seen, having apparently not yet been converted into bone (see Fig. 2).

As at this time I was working exclusively at the occurrence

[1] Kanthack: Illustrated Medical News, 1889, vol. v., p. 124.
[2] Retterer: Journal de l'Anatomie et de Physiologie, 1888, vol. xxiv., p. 1.

of tubercle in the tonsil this peculiar histological structure was merely noted for investigation at some future period. My interest in the subject was, however, again aroused in the following month by the occurrence of another example of a somewhat similar condition. The post-mortem examination of this case was held on Nov. 25th, 1895. The subject was a man, aged twenty-seven years, who died in the hospital from chronic pulmonary tubercle. Both tonsils were somewhat atrophied. The crypts with their lining epithelium were normal. Most of the closed lymphatic follicles had tumbled out during the process of mounting. In this instance there were scattered throughout the adenoid tissue of the organ large masses of cartilage which could be very easily distinguished with a lens magnifying about four diameters (see Fig. 1). In places the cartilage had been converted into bone. The matrix of the cartilage appeared in some places to be of the hyaline variety, but in others it could only be described as fibro-cartilage. The cartilaginous nodules were surrounded by strands of dense fibrous tissue which formed a kind of perichondrium. Some of these cartilaginous nodules, unlike the former case, penetrated the adenoid tissue of the organ and in one part they nearly reached the epithelium lining the free surface of the tonsil. I was at first much puzzled with this condition of the tonsil and at first supposed I had to do with a new growth—in short, with an enchondroma of the organ, a rare condition no doubt, but one that has been described by pathologists. But on thinking over the matter I came to the conclusion that this supposition was untenable as the cartilage and bone trabeculæ occurred on both sides. On reflection it appeared to me that there was a close analogy between these cartilaginous masses in the tonsils and those small cartilaginous growths which develop in the lines of the branchial clefts and which are found in the neighbourhood of the ear, or lower down in the neck, sometimes only on one side, but more rarely symmetrically placed on both, or enclosed in the so-called branchial cysts and also to the masses of cartilage that are found in the parotid gland. The tonsil, according to Professor His,[3] is developed very early in intra-uterine life—about the fourth month—by a simple folding in of the mucous membrane at a spot situated between the second and third branchial arches, and the remains of which are visible in the adult tonsil as a fold, the plica triangularis. As development proceeds this primary infolding of the mucous membrane or primary crypt splits up at its base into numerous secondary crypts and by the swelling of the meso-blastic tissue lining the invagination and by the early appearance of lymphoid follicles the rudimentary tonsil is formed. Remembering then the position in which the tonsil is developed, I think we may assume that these cartilaginous nodules are of fœtal origin, that is, they are cartilaginous rests derived from the second branchial arch.

After a search through foreign medical literature I have been able to discover three similar examples. Two of these were observed by Professor Roth[4] and one by Dr. H. Deichert[5] and all of them from the Pathological Institute of Göttingen. The first of Professor Roth's cases occurred in a man, aged fifty-nine years, who died from fracture of the skull; the tonsils were found to contain bony trabeculæ. The other case was that of a child, aged two years, sex not stated, who died from diphtheria. It is unfortunate that these two cases are only very shortly reported; but it is stated that the tonsils of the child contained mostly cartilage, although a little bone was also found. The third case, reported by Dr. H. Deichert, was that of a man, aged seventy-seven years, who died from aneurysm of the aorta. Large cartilaginous and bony masses were scattered throughout the organ. This peculiar fœtal inclusion is no doubt rare, but perhaps commoner than one would at first suppose. My two examples occurred in 34 consecutive post-mortem examinations and Dr. Deichert says in a footnote to his paper that he had heard of two other similar cases after his communication had gone to press.

FIG. 2.

From the man aged fifty years. It shows one of the cartilaginous nodules passing into bone.

FIG. 3.

Also from the same man. It shows one of the bone trabeculæ at the base of the tonsil.

I think there can be no doubt that the enchondromata that have been described as occurring in the tonsil must have their origin in these cartilaginous rests which from some unexplained reason begin to grow and proliferate. Clinically it is, I think, important to remember that this condition may occur in the tonsil as a congenital peculiarity. The bony trabeculæ, it will be observed, were principally found in persons of advanced age, and at first one would be disposed to look upon the presence of bone as a mere senile change; but it was also found to a less extent in the younger persons. I think it probable that these centres of ossification may be present from the first, as a small amount of bony material was found in the tonsils of the child aged two years observed by Professor Roth.

Professor Kanthack, to whom I showed the microscopical specimens, dissents altogether from the above theory. His view is that in these cases there is no embryonic inclusion, but merely a metaplasia of fibrous tissue into bone or cartilage. The accompanying micro-photographs show clearly this peculiar structure of the tonsil.

Harley-street, W.

[3] His: Anatomie der Menschlichen Embryonen, dritte Partie, p. 82.

[4] Roth: Festschrift zu Virchow's fünfzigjähriges Doctorjubiläum, Göttingen, 1893.

[5] Deichert: Virchow's Archiv, 1895 l. cxii., p. 435.

THE BACTERIOLOGY OF PROGRESSIVE CIRRHOSIS OF THE LIVER.[1]

WITH ILLUSTRATIVE PLATE.

BY J. G. ADAMI, M.A., M.D. CANTAB., F.R.S. EDIN.,

LATE FELLOW OF JESUS COLLEGE, CAMBRIDGE; PROFESSOR OF PATHOLOGY, MCGILL UNIVERSITY; PATHOLOGIST TO THE ROYAL VICTORIA HOSPITAL, MONTREAL.

IT is needless for me here to enter into a discussion of the various theories which have been adduced to explain the causation of cirrhosis of the liver. I need only say that the experience of a large number of investigators who for weeks and months have inoculated or treated animals with various alcohols have shown that alcohol itself induces at most the fatty liver with, it may be, a very slight amount of fibroid change in the portal areas and that not a single observer has been able by this means to produce anything at all resembling the extreme deposit of fibrous tissue which we meet with in the hobnailed liver. Alcohol in the main leads to the fatty liver, while, on the other hand, the evidence has steadily accumulated, notably in India, that extreme cirrhosis may attack children and adults who have never taken a particle of alcohol either medicinally or otherwise.

Within the last few years the French school of pathologists headed by Hanot have regarded the enlarged cirrhotic liver with jaundice as being of infectious origin, and it is common nowadays to speak in France of *le foie infectieux*, but to the best of my knowledge no one has as yet described any one micro-organism as being found frequently associated with these cases of so-called infectious liver. At most Levi[2] from a case of cirrhosis in a seventeen-year old male, with marked periportal fibrosis and enlarged spleen, obtained a diplococcus pathogenic for guinea-pigs. The age of the patient, the proliferation of the bile-ducts and the absence of ascites would indicate that this case was one of what is termed "Hanot's cirrhosis," but the bacteriology is rendered somewhat doubtful in that there was also present bacterial endocarditis of the pulmonary valve and suppurative meningitis. Unfortunately I have not been able to obtain the original paper; nevertheless, this brief statement of the main features of the case makes it at least possible that the endocarditis and meningitis and the presence of diplococci in all the organs may have been due to a complication. On the other hand, there is a somewhat suggestive relationship between these cases of Hanot's cirrhosis and epidemic jaundice, in some of which observers have noted the presence of a diplococcus or bacillus with polar staining. To the best of my knowledge no one has as yet recognised the frequent presence of any form of micro-organism in the commonest form of hepatic cirrhosis, the so-called portal cirrhosis tending to the production of the hobnailed liver with or without marked atrophy of the liver.

On behalf of the Government of the Dominion of Canada I spent the summers of 1894 and 1895 in Nova Scotia investigating a very remarkable disease affecting the cattle in a limited area of the country—the so-called "Pictou" cattle disease—of which the main lesion is a singularly extensive cirrhosis of the liver. The disease is only found in a district spreading along the northern coast of the peninsula, in a tract of country about forty miles long by from five to twelve miles broad. There apparently it has been noticed for some forty years, now at one end of this area, now at the other. The disease would seem to be very chronic and not to affect all the cattle upon the farm simultaneously, but unless due precautions are taken in the course of three or four years most of the cattle will one after the other be affected. It would seem further that the disease does not spread directly from animal to animal, for there appears to be no special incidence of the cases following upon the long winter sojourn of the animals in the byres, which, with rare exception, are miserably dark and ill-ventilated, the attempt being made to keep these as warm as possible in consequence of the severity of the winter. One or two cases are on record in which the disease has broken out in a neighbourhood after the body of a cow affected with the disease has been washed down by one of the streams and stranded upon farm lands. The gradual extension of the disease from farm to farm through any given district seems to be largely brought about by the fact that each farm has at the back of it a belt of woodland in which the cattle roam during the summer. These belts are badly fenced off from each other and if an animal is affected it attempts to wander off into the woodland and there die in a remote corner. Thus unless precautions are taken the carcasses of these animals remain uninterred and appear to act as centres of infection. Under the present Government regulations notification is given of every suspicious animal, and the Government inspector if satisfied that it is a case of the disease immediately destroys the beast and burns the carcass or has it buried in quicklime. By this means the number of animals affected is steadily being reduced, so that within the last few years the number of cases occurring annually has sunk from 150 to under 30. As for the symptoms of the disease the first which is to be noticed is that the milk acquires a peculiar bitter taste and has a distinctly acrid odour upon boiling. Within a few days the animal becomes dry, it is weak and listless, the coat stares, the limbs are dragged, the bowels are loose, the abdomen is a little swollen, the eyes are staring, and the conjunctivæ are subicteroid. The weakness deepens and the animal dies apparently in a condition of complete exhaustion. In some few cases death is preceded by a period of intense excitement, almost maniacal in character, the animal rushing about charging at obstacles and then falling into a condition of paresis followed rapidly by death. I killed and made post-mortem examinations upon some 30 animals during the two years and found, as Dr. Osler and Dr. Wyatt Johnston previously determined, that the main lesions are an extreme condition of generalised cirrhosis, not only periportal but pericellular, the organ being somewhat enlarged and having a smooth or more rarely a finely granular surface. There is evidently an abundant production of thin bile, for with scarce an exception the gall-bladder was found to be very full and the fæces well stained. The periportal and abdominal lymph glands in general are large and succulent, there is a moderate amount of ascites, the fluid being particularly clear and limpid, and together with this there is a rather remarkable condition of gelatinous œdema of the mesenteries and intestinal walls. A further constant lesion is the presence of numerous follicular ulcers in the fourth or true stomach. These, save in the very acute cases, are found in a cicatrised condition giving strongly the impression that the earliest lesions of the case are gastric and are followed by the infection of the abdominal lymphatic system and the portal area. The spleen is not markedly enlarged. From all the animals which I killed I was more fortunate than my predecessors in gaining a characteristic micro-organism. This may have been due to the fact that I employed a somewhat different method of making my cultures. Instead of taking the media

[1] A paper read for the author by Professor William Osler in the Section of Medicine at the meeting of the British Medical Association at Edinburgh, July, 1898.

[2] Archives Générales de Médecine, March and April, 1894.

DESCRIPTION OF ILLUSTRATIVE PLATE.

FIG. 1.—Microbe of Pictou Cattle Disease from isolated colony upon glycerinated agar roll tube inoculated from bile of diseased cow; stained with Ehrlich's gentian violet. Photograph under Reichert's $\frac{1}{12}$ in. immersion. The bacteria are seen, some as ovoid bacteria, the majority as diplococci surrounded by a faint halo.

FIG. 2.—Pictou Cattle Disease. Section of liver of cow killed while suffering from the disease, stained with carbol fuchsin for 24 hours, bleached in sunlight for six weeks after mounting. Photograph under Reichert's $\frac{1}{12}$ in. immersion. A few of the diplococcus forms can be well seen surrounded by a faint halo. These appear to be largely within the liver cells. With a magnifying glass the position of several others not in focus can be made out.

FIG. 3.—Pictou Cattle Disease. Section of liver of rabbit inoculated intraperitoneally with pure cultures of the microbe and dying 21 days later. Treated like the preceding and photographed under the same magnification. Innumerable diplococcus forms in the main within the liver cells, some, not perfectly in focus, seen as ovoid bodies, others as dots (end on ?). The varying size apparently is due in part to polymorphism, in part to unequal bleaching.

FIG. 4.—Progressive Cirrhosis in Man. Section of liver from case of more diffuse cirrhosis than the preceding; treated similarly. *a.a.* Diplococcus forms within degenerating liver cells. *b.b.* The same in the immediate neighbourhood of what appears to be fusiform connective tissue nuclei. *c.* Group of diplococcus forms obscurely seen within a liver cell.

FIG. 5.—Progressive Cirrhosis in Man. A culture, 48 hours old, from kidney juice on glycerinated agar showing diplo-bacillary form.

FIG. 6.—Progressive Cirrhosis in Man. Slide preparation, 24 hours old, isolated colony on agar glycerinated and inoculated from liver juice. Preparation shows transitional forms, bacterium (ovoid), diplococcus, and bacillus.

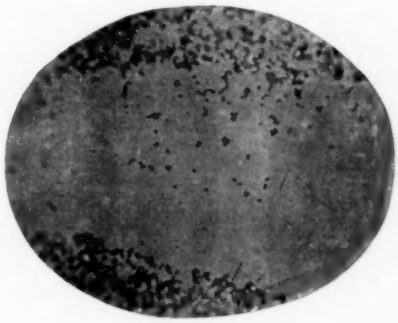

Fig. 1.

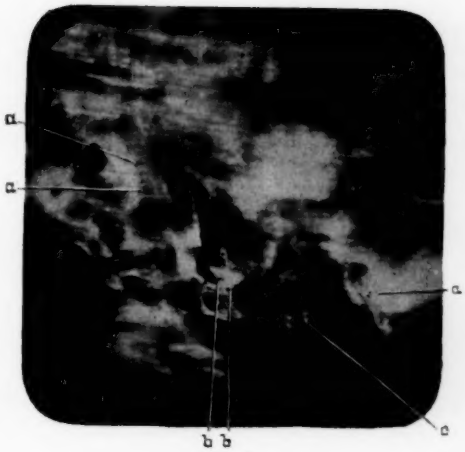

Fig. 4

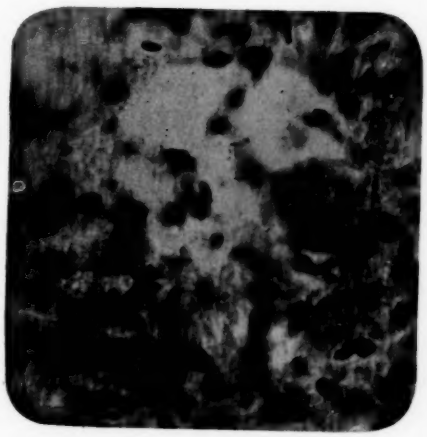

Fig. 2.

Fig. 5.

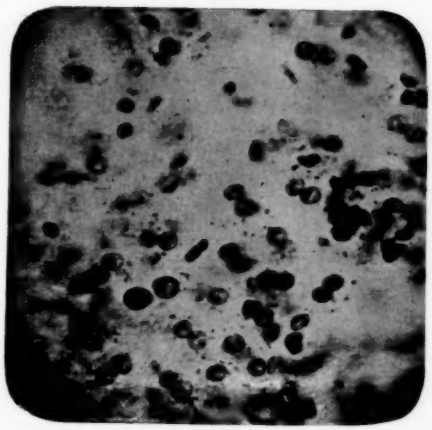

Fig. 3.

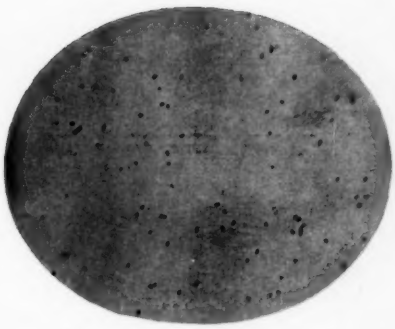

Fig. 6.

TO ILLUSTRATE AN ARTICLE ON THE BACTERIOLOGY OF PORTAL CIRRHOSIS, BY PROFESSOR ADAMI, F.R.S.Edin.

and inoculating on the spot I employed a series of sterilised glass pipettes in which I collected relatively large amounts of the juices of the various organs, ascitic fluid, blood, &c., and then when back in my temporary laboratory, either upon that or the following day, I inoculated my media. By this means, constantly from the lymph of the abdominal glands and from the liver juice and more rarely from other organs and fluids, I obtained in each case growths of a characteristic micro-organism, small and polymorphous, at times appearing as a diplococcus, at other times as a stumpy bacillus or diplo-bacillus. This by its polymorphous character gave me a considerable amount of trouble until I found that employing the same broth or agar tube at the end of twenty-four hours I obtained the one form and at the end of forty-eight hours the other, while also the depth of the stain employed altered the appearance. Further study showed me that this micro-organism was in reality a short bacillus with polar staining, in this resembling to some extent the micro-organisms of hæmorrhagic septicæmia in the lower animals, but unlike them possessing a slight capsule. I was able to grow this upon all the ordinary media of the laboratory (Fig. 1). Into the characters of this micro-organism I will not here further enter, beyond stating that I found it pathogenic for rabbits, guinea-pigs and mice, rabbits dying in from 15 to 25 days and guinea-pigs in from 30 to 35 days on an average. The characteristic features of this disease, the ascites without jaundice, the gastric and intestinal disturbances, and the condition of the liver led me seriously to consider the similarity between the clinical history in these cases and that present in portal cirrhosis in man, and though it may seem a small matter I was especially struck that the first post-mortem examination which I performed upon a case of atrophic cirrhosis upon my return from Nova Scotia exhibited the same gelatinous œdema of the mesenteries and intestinal walls which was so prominent a feature in the Pictou cattle disease.

Thus on and off for the last three years my attention has been directed towards the possibility of discovering bacteria in ordinary progressive portal cirrhosis, and, indeed, upon three occasions I have thought that I had gained specific micro-organisms. In two, unfortunately, the growth became contaminated with the colon bacillus, and as they occurred on the eve of my vacation I was unable to continue the search further. In the third, which occurred in June of the present year, the growth was very slight and, although pure, it had apparently died out by the fifth day and I was unable to gain any further cultures. The difficulty which has pursued me in this search has been that which has prevented me from publishing so far any extensive report upon my studies on the Pictou cattle disease—namely, the extraordinary difficulty in staining the micro-organisms in the tissues. I have tried a very great number of methods and while with many I have been able to recognise the bacteria the results obtained have been so inconstant that I have felt that others following my steps might possibly have negative results. Thus I have been unwilling to make any full statement until I should be able to state clearly how to recognise the micro-organisms.[3] While this micro-organism stains deeply it appears to lose its stain even more rapidly than does the tissue. Sometimes Gram's or Weigert's method shows the micro-organisms brilliantly, but while the iodine appears to have a deterrent effect upon the decolourisation of the microbes the stain is not properly fixed by this means; and while, again, I have obtained good results by staining in methylene blue dissolved in anilin oil, momentarily passing the sections so stained through a mixture of anilin oil and xylol, through xylol into Canada balsam, even here the colour appears to fade out rapidly, so that in a few days the micro-organisms are unrecognisable. Eventually the thought struck me that bleaching in the sunlight might be a possible means. By this process there would be no diffusion currents set up and if, as my previous work had shown, the bacilli took up the stain with rapidity then the deeply-stained sections would have so much of the dye in the bacilli that upon bleaching out the bacilli would be left stained when the tissue itself had become colourless. My laboratory assistant, Mr. E. W. Hammond, prepared a large series of sections in this way and obtained some excellent results. He found that, as I had suggested, strong staining with carbolised fuchsin followed by bleaching for a short time each day for a period of a fortnight or more demonstrated the bacteria admirably.[4] While the process is a slow one it is one which has the undeniable advantage of allowing the mounted sections to be examined each day so as to determine how far the process of bleaching has progressed. By this means I was able to find out that in the Pictou cattle disease the micro-organisms while present scattered through the new fibrous tissue are present also in large numbers within the liver cells, and in the liver of a rabbit which had been inoculated with the micro-organism isolated by me, although the animal died before any marked cirrhosis had developed, the liver cells were seen to contain these microbes in very great numbers (Figs. 2 and 3). As to how the micro-organisms enter these cells, or whether truly they are within the cells or in the minute biliary canaliculi which permeate them (and so truly outside the liver cells), is a point upon which at present I can throw no light, but the appearance given, which will be seen in a specimen under the microscope in the pathological exhibit, is that these cells contain large numbers of extremely minute diplococci.

Only quite recently a remarkable case of cirrhosis with pigmentation unaccompanied by diabetes has again drawn my attention to the bacteriology of atrophic cirrhosis. Dr. Maude Abbott, who is working in my laboratory at the Royal Victoria Hospital, showed me some sections of the abdominal lymph glands stained by Weigert's fibrin stain in which under a high power I noticed a peculiar fine granulation, and upon examining with $\frac{1}{12}$ in. immersion these fine granules resolved themselves into minute diplococci. Examining the liver stained similarly I there noted large numbers of the same micro-organism and since then I have gone through all the five cases of cirrhosis which I have had during the last three years, through specimens of five most characteristic cases of hobnailed liver received from Professor Hektoen of the Rush Medical College, Chicago, and through a series of sixteen livers, some of well-marked atrophic cirrhosis and others of milder stages of cirrhosis, courteously sent me by Dr. Flexner from the Johns Hopkins Hospital. So far in every case of well-marked portal cirrhosis, whether of the small shrunken type or the large hobnailed type, whether associated with jaundice and without ascites or with ascites without jaundice, I came across constantly one characteristic form of micro-organism, obtaining the best and most permanent results by the method I have already mentioned of staining in carbolised fuchsin and bleaching or partially bleaching in the sunlight. Here I gladly acknowledge the assistance I have received from Mr. W. M. Abbott and Mr. C. Nicholson in preparing and staining this material. Mr. Nicholson, who will demonstrate illustrative specimens in the Pathological Museum, finds that he obtains the surest results by using Ziehl-Nelsen carbol-fuchsin, either pure for five hours or diluted with an equal bulk of water for from twelve to eighteen hours, washing in absolute alcohol, then through xylol into xylol Canada balsam. Mr. Hammond's method was very similar. The time necessary to bleach of necessity varies. Working in winter Mr. Hammond required from a fortnight to a month. In the powerful sun of Montreal in July Mr. Nicholson found two days sufficient, and even then the process had gone too far, the microbes being decolourised. On the whole, therefore, sections cut frozen gave surer results than those prepared in paraffin, the irregularity in thickness of the former ensuring that some portions are bleached to the desired extent. This micro-organism is extraordinarily minute. By the trained eye in well-stained specimens it can be just recognised under the $\frac{1}{12}$ in. immersion lens, but for satisfactory work it is absolutely necessary to employ the $\frac{1}{12}$ or $\frac{1}{20}$ in. immersion lens. According to the depth of the stain so does it appear either as an ovoid bacillus, which might easily be mistaken for some stained deposit in the liver cells, or as a minute diplococcus surrounded by a distinct halo, the explanation being that with strong staining the bacillus and capsule are stained throughout, and with weak staining the body of the micro-organism and the capsule are decolourised, leaving simply the polar staining. Even in the tissues these micro-organisms are somewhat polymorphous—that is to say, at times one sees the two stained portions so close together as to resemble a minute edition of the

[3] Reports upon my observations are given in the Reports of the Dominion Department of Agriculture for the years 1894 and 1895.

[4] It is but simple justice to Mr. Hammond to state that, while I suggested this method, the carrying out of the process was wholly his. But for his zeal my investigations would be far less advanced.

gonococcus, at other times they are farther apart and appear rounded like the coccus form of the pneumococcus, while in the same specimen a rare form may be seen in which the two stained portions are even slightly elongated. These are present in greatest numbers within the liver cells but occur also in the new connective tissue, sometimes in cases where there is much small-celled infiltration in localised patches, where they are present in great numbers, sometimes along fine channels which I can only regard as lymphatic capillaries. So far I have not recognised them in the bile-ducts, although by analogy with the Pictou cattle disease, in which I not unfrequently gained cultures from the bile, it is not improbable that some at least escape from the liver by this means. In one liver received from the Johns Hopkins Hospital Mr. Nicholson tells me that he recognised them definitely within the smallest bile-ducts. One remarkable feature about them, one which years ago I noted in connexion with the Pictou cattle disease, is that whether they be seen in the lymph glands or in the liver they have in the unstained condition a distinctly brownish tinge, so that in the liver especially these bodies may at first sight be mistaken for minute granules of precipitated bile pigment. They vary in number; in two cases in which the disease appeared to be of very slow progress but few were present; in those cases in which the bands of portal connective tissue showed an abundance of small round cells and in which the disease according to all indications was active and progressive the number was remarkable—in fact, so great that it was impossible for me to arrive at any other conclusion than that there is a distinct association between the presence of these micro-organisms and the development of the disease. So minute are these micro-organisms that it is extremely difficult to focus them and I would strongly urge those attempting to confirm these observations to take from twenty minutes to an hour studying an individual field of the microscope before arriving at any conclusion. Indeed, I know of no form so minute save that recently described by Nocard and Roux as being the causative agent in the contagious pleuro-pneumonia of cattle, and the strain upon the eyes in studying these microbes is most severe. This adds greatly to the difficulty on photographing the micro-organisms.

I am indebted to Dr. Patrick, the photographer of our hospital, for the accompanying lantern slides, in which, despite great difficulties, he has managed, I think successfully, to demonstrate the organisms in the tissues, but with regard to this I may say that where he shows one micro-organism the slightest change of focus would bring others into view, so that his slides show but about 1-20th of the number recognisable in any given field. The drawing, made under the camera lucida from the centre of the field reproduced as Fig. 3 in plate, will give an idea of the frequency of these microbes.

As to whether the micro-organisms in the human and in the bovine liver are identical it is impossible for me to affirm. At the Johns Hopkins Hospital as in our own hospital and in a large number of foreign hospitals, not to mention the leading hospitals in the old country, it is now the custom to obtain cultures from half-a-dozen or more regions, including the liver, in every necropsy performed within fifteen hours after death. And while the methods employed for obtaining cultures are in many cases faulty, to the extent that an insufficient amount of tissue juice is taken, it seems to me unlikely that had this form been cultivable upon the ordinary media it would not before now have been isolated. Nevertheless there is this to be said, that very frequently the colon bacillus grows upon cultures made from the liver; isolated colonies of the micro-organisms from the Pictou cattle disease, while growing more slowly, are not unlike those of the colon bacillus, and thus possibly the micro-organism, if growing in a manner similar to that of the Pictou cattle disease, might be neglected on account of this similarity in appearance.

It so happens that in Montreal cases of the disease are few and far between; five cases only have come under my notice in four years, and in a series of 934 necropsies made during twelve years at the Montreal General Hospital and indexed by Professor Wyatt Johnston, I find that altogether 31 cases of cirrhosis of the liver are recorded and 14 of the cirrhotic and fatty liver, with 1 recorded as "hypertrophic cirrhosis." I have thus thought it wise to publish these observations, even though I can at the present moment make no absolute statement with regard to the isolated micro-organism and its characters beyond the statement that, as already mentioned, in one agar tube made from the liver juice I was able to recognise the form although in not very great numbers and with the absence of any visible growth.

Lastly, as to the cases in association with which I have found this micro-organism. If future observers confirm the observations given above then we must conclude that many of the divisions and distinctions attempted to be drawn between the forms of advanced cirrhosis of the liver must be broken down; for, in the first place, I have found the same appearances in the large liver with moderate granulation or slight hobnailed condition which some would speak of as "hypertrophic cirrhosis"; as again in the small contracted typical hobnailed liver; in cases frankly multilobular with sharply defined bands of connective tissue cutting off relatively large areas of liver substance and showing relatively few bile-ducts; as again in cases of the more unilobular type with ill-defined edges to the lobules and abundant bile-ducts; in cases which have shown jaundice without ascites, ascites without jaundice, and again both jaundice and ascites; and, lastly, in cases with a pronounced alcoholic history and others in which no history of alcoholism could be obtained.

I am far from wishing it to be understood that I am here laying down that all cases of fibroid change in the liver present these minute micro-organisms; to make any such suggestion would be absurd. Nor, again, am I prepared to say that Hanot's cirrhosis affecting the young adult and presenting an enlarged liver with smooth surface and, accompanying this, crises of icterus is identical with the more ordinary form of progressive cirrhosis affecting the adult. It may be so or it may not. After forty years of age cirrhosis is, according to my investigations, accompanied by the presence in the liver cells, as again in the newly-formed connective tissue, of an extraordinarily minute bacillus having a polar staining and resembling greatly in its appearance under the microscope a form which I isolated from cases of infective cirrhosis among cattle.

I cannot conclude without again expressing the debt under which I labour to several helpers. To Dr. Maude Abbott and to Dr. Patrick; to my laboratory assistant at the University, Mr. E. W. Hammond, who aided me very materially in Nova Scotia; to Mr. Howell, my assistant at the Royal Victoria Hospital, but for whose energy I should have been unable to prepare and examine all my material; to Mr. Nicholson, who has most gladly crossed the Atlantic to demonstrate my specimens during the course of the meeting; and, above all, am I indebted to a member of the McGill University, my predecessor not only in the chair of pathology, but also in the investigations in the Pictou cattle disease, than whom none, not even myself, could more willingly or more appropriately or better have brought this subject before you.

APPENDIX (*July 12th, 1898.*)

By a remarkable coincidence, upon the afternoon of the day upon which I completed the dictation of the foregoing paper in order that I might have it complete for Dr. Osler to take with him to Edinburgh I was called to perform a post-mortem examination upon a case apparently of heart failure which turned out to be one of atrophic cirrhosis of the liver. I should here add that a diagnosis of cirrhosis of the liver had been considered and had been left in doubt, while clearly, from the condition of the heart, death had resulted from failure of that organ. Not to enter too fully into the details of the case—for the clinical notes of which I am indebted to Dr. James Stewart—I may say that the body was that of a female, aged fifty-six years, who had always lived in Canada, and who, after the diseases of childhood, had until two years previously enjoyed good health. She had ten children with no miscarriages and there was no history of inherited disease. She gave a moderate history of alcoholism, stating that she chiefly drank beer, but if one may base any argument upon the frequent presence of minute whitish plaques scattered along the œsophagus she was a pronounced alcoholic. For the last two years she had not been well, dating her impaired health from a fall while out walking when she injured her back somewhat. For the last year her heart had been very weak and upon exercise her feet and legs became swollen. Since last April the weakness, swelling of the legs and abdomen, shortness of breath and palpitation had been much worse, and for three days before admission to hospital dyspnœa, sleeplessness, and weakness had been extreme, while for months she had steadily been losing flesh. Upon admission she was found to be sallow

in appearance, with moderate anæmia of mucous membranes; the sclerotics were icteroid with distension of the superficial vessels; the face was emaciated and there was orthopnœa. The temperature was normal, the pulse was rapid and the respirations were 36. The skin, more especially of the face, neck and arms, was of a peculiar ashy colour. This, she stated, had been noticeable for some years; there was slight general œdema, marked œdema of the lower extremities, and definite ascites. The pulse was 100, very irregular in volume and rhythm, and the apex-beat was not recognisable; there were no murmurs. There was evidence of right-sided pleurisy and there were numerous coarse and fine râles with expectoration of frothy mucus. There was frequent vomiting and retching, though this had begun only a few days before admission to hospital. The urine was dark, amber-coloured, with flocculent sediment, a fine ring of albumin, and it contained some bile. For a week or more her condition improved; the heart became more powerful and the ascites diminished. Suddenly, upon July 6th, the patient died.

The necropsy was held six hours after death and showed the following conditions. The heart was large, full, with dilatation of the cavities, the muscle being somewhat atrophied and fibroid. The coronary vessels were atheromatous. All the valves were normal and in both auricles were puriform and breaking down ball thrombi indicating a very feeble circulation. Both lungs showed adhesions to the diaphragm and elsewhere and on section presented little beyond œdema save that the lower lobe of the right lung was almost completely compressed and airless as a result of a right-sided pleurisy. The right pleural cavity contained about 700 c.cm. of red-stained fluid without flocculi. The abdomen contained between 900 and 1000 c.cm. of turbid and greenish ascitic fluid. Neither liver nor spleen were visible. The stomach was long and narrow with mucosa thickened, the cardiac portion having a curious strawberry-like appearance with fine white dots standing out but not projecting from the generally reddened surface. This faded off in the pyloric portion of the stomach where there was a fair amount of mucus. The first three inches of the duodenum presented an identical strawberry-like appearance to that seen in the cardia. The small intestine in general was congested and the last 3 in. before the ileo-cæcal valve showed large prominent solitary follicles. The walls of the small intestine had a distinctly brownish tinge as of von Recklinghausen's hæmochromatosis. The mesentery of the small intestine was not only fatty but markedly swollen and upon section abundant milky lymph poured out wherever it was cut. The abdominal lymph glands were in general reddened and succulent. The retro-peritoneal glands, especially those in the neighbourhood of the portal fissure, and of the pancreas, were markedly enlarged. The liver was distinctly small, weighing 1045 grammes or a little over 2 lb.; the two lobes were correspondingly diminished in size, the organ was pale and had a finely granular surface, and there were abundant old fine veil-like adhesions over the upper surface to the diaphragm. On section the organ cut fairly firmly, more especially along the lower half of the right lobe and the under surface. On the whole the appearance on section was more fatty than fibroid. Microscopically the organ presented along with fibroid thickening of the portal sheaths a somewhat diffuse cirrhosis, the bands of fibrous tissue not being sharply cut and being infiltrated with a considerable number of small round cells. The cirrhosis was very obvious, but not of the more usual type, and the diffuse nature of the change may explain why the surface was finely granular rather than distinctly hob-nailed. The gall-bladder had œdematous thickened walls. The spleen was of normal size and rather soft, although on section the trabeculæ were seen to be larger and more prominent than usual. The pancreas was voluminous and moderately firm. The suprarenals were of fair size. The kidneys were of the hog-backed type of mixed interstitial and parenchymatous nephritis. This so-called hog-backed appearance is that which, as I believe Formad of Philadelphia was the first to point out, is the more common form of alcoholic kidney in North America. The organs were large with a finely granular surface and full and firm cortex. There were white infarcts both in the kidneys and the spleen. The body was still warm at the time of the holding of the necropsy and I obtained numerous sterilised pipettes of tissue juice from the liver, spleen, kidneys, abdominal lymph glands, ascitic fluid, pleural fluid, pericardial fluid, blood, and lymph from the mesentery, and with these I made a series of inoculations on the surface of sloping glycerinated agar tubes as also some into broth. While I have not had time to examine all the organs microscopically for bacteria I have studied the liver and there found the same diplococcus forms which I have already described as being recognisable in the cirrhotic liver. Portions of the collected ascitic and pleural fluid were centrifugalised, the cellular débris dissolved by caustic potash, and after further centrifugalisation the deposit was examined under the microscope after staining with carbolised fuchsin. This deposit showed rather rare minute diplococcus forms with a slight halo round them similar in all respects to those recognised in the tissues.

A series of slide preparations was made from the various pipettes direct, fixed in the usual method and stained with carbol fuchsin, which was warmed until definite vapour was given off, then washed with water just cool enough to bear the hand in it, and mounted. As a result the characteristic diplococcus form was found in the preparations made from the liver, lymph from the mesentery, the ascitic fluid, the heart blood, the left kidney, and the mesenteric glands; they were not found in the pleural cavity, the bile, or the pericardial fluid. Next, using a fair amount of the fluid out of each pipette I allowed this to flow over the surface of slanting glycerinated agar tubes, my experience with the Pictou cattle disease having shown me that while the fluid in the pipettes could show numerous diplococci, apparently the majority of these are dead and only a few remain alive. By this means in 24 hours I obtained fairly frequent growths in tubes from the spleen and left kidney and rare growths in the mesenteric glands and heart blood. Two colonies only appeared upon the tube prepared from the liver and four from the ascitic fluid and this latter did not show clearly till the expiration of forty-eight hours. Subcultures made again directly upon the glycerinated agar surface showed a fine, rather thin growth at first of minute discrete colonies; later these ran together into thin waxy lines which, upon the expiration of four or five days, assumed a faint yellowish tinge.

Other tubes were made directly from the pipettes of the kidney and spleen into beef broth. This upon the following day showed a faint turbidity, which just, as in the case of the Pictou cattle disease, if anything lessened with further growth, while a whitish deposit formed at the bottom. Since then, using the remaining pipettes, I have obtained a great number of broth cultures, the growth being much more free upon this medium than upon the agar, and, further, yielding forms which are more characteristic and less liable to cause confusion, for the micro-organism is most remarkable in its characters.

Grown upon broth in 24 hours it is present in the form of minute diplococci surrounded with a faint halo or capsule. Often these tend to be arranged in irregular chains in which the separate couples of dots are not quite regularly arranged, the long axis joining the two dots not of necessity coinciding with the long axis of the chain. Grown upon glycerinated agar the appearance is most puzzling, and although I had a similar experience when working out the character of the micro-organism of the Pictou cattle disease these agar cultures have given me a week of profound anxiety until within the last 24 hours I have solved the problem. A 24 hour culture at 37° upon glycerinated agar reveals minute forms which upon careful staining with fuchsin, not too deep, are clearly formed of a diplococcus (Figs. 5 and 6). One gets every transition, from the frank diplococcus form through one in which only very careful focussing shows that the somewhat oval bacterium has at either pole a deeper stained mass (Fig. 6) to forms in which the polar staining cannot be made out so that one appears to deal with true short bacilli (Fig. 6). In addition to this a certain number of oval forms can be seen still smaller than the diplococcus in which the distinction between the two ends cannot be made out. In 48 hours, and still more in 72 hours, the same culture which had given this appearance at the end of 24 hours appears to be contaminated by the presence of long distinct bacilli—that is, if sections be well stained with fuchsin, while this is still more the case after staining with Löffler's methylene blue. At first sight a culture from this variety showing these bacilli of irregular length with rounded ends, often lying side by side, appears to be undoubtedly of the colon bacillus of some allied form. And here I gain an explanation of the contrary results obtained by a bacteriological *confrère* and myself made in London two years ago. I took to him cultures isolated from two cases of cirrhosis which on examination in Montreal seemed to be diplococci, and his statement that he found only colon bacilli made me cease my investigations for the time. I can now well understand his most pardonable mistake.

Yesterday, upon examining the agar-plate culture from the spleen, which had been made upon July 7th, had been left for 24 hours in the incubator and there apparently yielded no growth, and it thus had remained for 4 days at the ordinary temperature in the shade, I recognised one form of growth extremely minute, the colonies well separated from each other. Upon removing one colony and making a coverslip preparation stained with fuchsin I found that I had to deal with long chain-like bacilli interspersed with some shorter forms of the same breadth. The appearance was so wholly unlike anything that I had previously made out in the broth cultures that I neglected this colony and made a culture from another identical in appearance and equally isolated, and in this case, after staining with fuchsin, and as I thought over-staining, I washed in absolute alcohol. The result obtained was most remarkable. The long bacillary forms could still be recognised in this as in the other specimen, and if anything they were longer, but each long filament showed a discoloured sheath in which, scattered at not perfectly regular intervals, were pairs of dots deeply stained. In some places individual dots could be clearly recognised, in others they were fused into short deeply stained lengths. These pairs of dots in size resembled the diplococcus-like forms seen in the broth cultures and in the tissues to which I have already so frequently drawn attention. I regret that time has forbidden that I should obtain photographs of this very curious appearance so that they could be demonstrated with the lantern. In the series of preparations which will be found in the Pathological Museum this form will be placed under the microscope and there will also be a series of sketches made by me under Zeiss's camera lucida showing this appearance. I touched the same colony with a platinum needle and inoculated a broth tube from it and eight hours later, the broth having in the meantime been kept at 37° F., it showed a faint turbidity, and now some specimens treated with carbolised fuchsin in the same way showed in place of the singularly long filament of the original colony numerous diplococcus forms, fairly large, in which the connecting, more colourless portion could be well seen, while here and there is a rarer form showing three instead of two dots along the course of the bacillus. These observations satisfactorily explain the curious condition of affairs. The microbe which is seen in the tissues as a diplococcus surrounded by a faint halo is in broth after twenty-four hours present also as a diplococcus of the same size, rather larger, showing or not showing the halo according to the extent of the stain. Upon agar-agar, while first present as a diplococcus form, it gradually extends and each day is seen as a longer bacillary form, but if stained and decolourised with carbolised fuchsin, and decolourised to the right extent, each long filament is seen to be made up of diplococcus-like members lying in a common sheath. I made out a similar condition of affairs in connexion with the Pictou cattle disease, but do not remember to have met with such long filamentous forms.

We seem thus to be dealing with a form totally unlike any which, to the best of my knowledge, has been described; the polymorphism is remarkable. It is most difficult, however, to determine how to describe the appearances seen, and I am at a loss whether to state that we are dealing with an encapsuled diplococcus or with a bacillus having inclusions taking a peculiar deep staining, just as in the ordinary cell the nucleus stains deeper than the surrounding protoplasm. The general appearance in the tissue is certainly that of an encapsuled diplococcus, but, on the other hand, grown outside the body and upon agar and then treated with Löffler's methylene blue the whole of that portion which plays the part of a capsule to the diplococci takes on a stain with as great intensity as do ordinary bacteria. On the whole, at present I am inclined to the latter view, because examining tubes in which proliferation is most rapidly proceeding I find upon staining with carbol fuchsin and decolourising with alcohol that one has in those youngest ovoid forms what is most suggestive of the polar staining such as one sees, for example, in the bacteria of hæmorrhagic septicæmia—that is to say, there is at either pole not a complete coccus form but a generally deep staining concavo-convex segment, the two parts being separated by a clear space, and the membrane joining the ends of the opposite crescents being clearly visible. If this form coincides in other respects with the micro-organism of Pictou cattle disease it will grow rather more easily upon slightly acid media, it will grow upon serum and very slowly in gelatin without marked liquefaction and will be fatal for animals of the laboratory at a relatively long period after inoculation. It so closely resembles the micro-organism of the Pictou cattle disease that I feel that I may safely prophesy this. The time taken in unravelling the mutability of growth upon agar-agar has prevented me from working out these points during the last few days.

The great similarity in appearance presented by growths upon agar-agar under ordinary staining to the colon bacillus may perhaps make it necessary to say a few words about the relationship of the micro-organism isolated by me to the bacillus in question. I have made growths side by side and find that in broth the colon causes a greater turbidity; it appears to grow more freely upon agar-agar and also to be endued with greater motility. Upon staining an 18-hour broth culture of my micro-organism by the Nicolle Morax method in order to demonstrate flagella I found the micro-organisms which are even more stumpy than the colon bacillus under similar circumstances to be possessed of either one or two terminal flagella, but not of lateral. This if it were necessary would seem distinctly to prove that the micro-organism is wholly distinct from the colon group. However, I make this statement provisionally and will give fuller details as to the characters of the micro-organism within the next few months, probably in the *Journal of Experimental Medicine*.

I trust, however, that I have said sufficient to prove:—1. That in at least a very large number of well-marked cases of progressive cirrhosis in man there is to be found largely within the liver cells and also in the lymph spaces in the newly formed connective tissue a peculiar and very minute form of micro-organism, presenting on staining to the proper extent the form of a diplococcus surrounded by a faint halo or when stained deeply being a rather obscure ovoid bacterium, which may easily be mistaken for stained deposits within the cells. 2. That in the infective cirrhosis of cattle a very similar micro-organism is recognisable, present in like positions within the tissues and showing similar appearances when stained. 3. That from at least thirty cattle affected with this disease I have been able to isolate the micro-organism from the liver, bile, abdominal lymph glands, and in some cases from the various organs in the body. 4. That the micro-organism isolated from these cattle is a polymorphous micro-organism, appearing as a small diplococcus when grown upon broth, and tends to assume a distinctly bacillary form when grown on solid media. 5. That this micro-organism is pathogenic for the animals of the laboratory, and that in them it is to be recognised within the hepatic cells as in other regions. 6. That from a case of distinct atrophic cirrhosis in the human being I have been able to isolate from various organs of the body a similar micro-organism, which grown in broth has a diplococcus form and grown upon agar is present as a short or longer bacillus according to the age of growth.

This is not the occasion for me to discuss at length the bearing of these observations upon the nature of progressive cirrhosis in man. It is only necessary for me to say that if they are confirmed, as personally I feel they must be confirmed by everyone who proceeds with sufficient caution to follow the methods employed by me, then cirrhosis of the liver assumes an entirely new aspect. We gain a satisfactory explanation at once of such phenomena as the enlargement of the spleen, which, as has already been noted, by more than one observer, may be made out before there is any sign of portal obstruction; we see why so frequently there should be right-sided pleurisy and may even find that the question as to whether a case is complicated with ascites or jaundice depends upon this micro-organism, depends upon whether it sets up a low inflammation of the peritoneum or whether it more especially affects the liver cells and the bile-ducts, while disturbances which may occur not immediately in connexion with the liver—in the pancreas and in the kidney, for example—would seem to gain a possible explanation from the fact brought out by me that this micro-organism, while frequent in the liver cells, is in an advanced case to be gained from the heart blood and from the kidney. That the micro-organism only causes cirrhosis I do not believe; indeed, we may find that it is the cause of more than one disturbance in the liver and indeed in other organs. This I base upon the fact that in the case in which I have isolated this form from man the micro-organism shows itself capable of existing in several regions of the body; in fact, of setting up what bacteriologically we regard as a septicæmic condition.

Montreal, Canada.

DIABETIC COMA SUCCESSFULLY TREATED BY SALINE TRANSFUSION; NO RELAPSE FOUR WEEKS AFTERWARDS.

BY THOMAS OLIVER, M.A. DURH., M.D. GLASG., F.R.C.P. LOND.,

PHYSICIAN TO THE ROYAL INFIRMARY, NEWCASTLE-UPON-TYNE.

IT is the general experience of those who have had to treat diabetic coma by saline transfusion that while consciousness may be restored this is of short duration, for the individual after a few hours lapses back into coma, from which a second saline injection fails to arouse him. In putting the matter thus I believe that I am only stating what has been the experience of most physicians. There have of course been exceptions and I venture to record the following case because the notes relate rather an unusual experience—viz., that at the time of writing the patient has remained perfectly intelligent during the twenty-eight days which have elapsed since the transfusion.

A man, aged thirty years, was on June 25th, 1898, admitted into the Newcastle-upon-Tyne Infirmary under my care suffering from diabetes of fully eight months' duration. Nine months ago he became very thirsty and began to drink large quantities of water. He would frequently drink three large bottlefuls of herb beer at a sitting and his night's rest was broken by his being obliged to get up to assuage his thirst. Eight months ago, as he found himself getting weaker, he gave up work. For the previous eleven weeks he had been very constipated, a condition hardly relieved by aperient medicine. Since his thirst became established he had passed large quantities of urine and he had lost weight to the extent of 4 st. There was nothing of importance in the patient's family history. Beyond having had pleurisy five years ago and two mild attacks of influenza since, he had been a very healthy man, and although he had lost flesh he was still well covered. His skin was dry and lemon-coloured, his tongue was dry and covered with a white fur, and the saliva, which was acid, did not contain any sulphocyanic acid. Upon his thighs there were several brown patches, the remains of pustules which came out a few months before. The knee-jerks were absent, the heart and lungs were healthy, and the skin of the abdomen was at places chocolate-coloured. The liver dulness was normal and the splenic dulness was slightly more pronounced than usual. The patient was placed upon diabetic diet and codeia, and on the whole appeared to make fair progress. On the afternoon of July 12th he left the infirmary in order to go home by rail, a distance of thirteen or fourteen miles, but he was brought back to the infirmary the same evening in a state of coma. He had, it appears, reached the station all right, but there he must have become confused, for a few hours afterwards he was found in a railway carriage at Tynemouth in a state of unconsciousness and on a different line of railway from that by which he should have travelled. Dr. Rowell, the house physician, recognising the patient who had left the infirmary only a few hours previously and finding him comatose, at once transfused him with two and a half pints of saline solution, passing it slowly into the right median basilic vein, and also freely purged him. The saline solution was composed of one drachm of chloride of sodium to one pint of boiled distilled water, the temperature of which was reduced to 112° F. During the operation the patient became sufficiently revived to complain that he felt pain. Before the transfusion his pulse was beating at the rate of 45. By degrees consciousness was regained and has since been retained. For the first three days after the transfusion a very small quantity of urine was passed daily—only 21 oz. instead of from 140 to 200 ounces when he was first in the infirmary. As the patient was known to be suffering from diabetes it was unfortunate that his urine was not examined on his readmission during and immediately after the coma, but the day afterwards it was found to be free from albumin and acetone, although containing sugar. Since then the amount of urine passed has gone up by leaps and bounds until he passed daily 190 oz. On July 15th the skin on the back of his hands was rather more bronzed than usual, the pulse was 52, markedly dicrotic and compressible, the tongue was dry, and the saliva was acid. The pupils were slightly dilated. The urine on July 15th was acid and its specific gravity was 1025; it contained sugar, but neither albumin nor acetone. On July 18th the patient complained of slight numbness in the right hand, but while there was slight anæsthesia there was no analgesia, although there was quite distinct paresis of the extensor muscles of the wrist compared to those of the left hand. There was very slight wrist-drop.

The case is interesting mainly on account of the length of time consciousness has been retained since the transfusion, which is a cogent reason why in diabetic coma such a line of treatment should be adopted. Not only was the patient rescued from a condition which in all probability would have proved fatal, but he has been so restored that had he been a wealthy man with a will to make or business matters to arrange he would have been able, with his present state of health and clearness of intellect, to accomplish it. I regret that there is no mention on his clinical chart of the quantity and the character of the urine passed in the twenty-four hours for the two days prior to his leaving the infirmary. In most cases I have noticed that before diabetic coma supervenes the patient passes a very small quantity of urine compared to what he had passed previously and that usually this urine contains albumin. Sometimes, indeed, there is almost complete suppression of the secretion of urine. During diabetic coma if a catheter is passed into the bladder perhaps only a few drachms of urine are drawn off, which contains both sugar and albumin. Then for the first time we learn from the nurse that no urine has been passed for the previous twenty-four hours or more. While therefore I do not deny that diabetic coma may be due to acetonæmia caused by the presence of diacetic acid in the blood, I am disposed to regard it rather as the result of a mixed toxæmia in which uræmia plays not an unimportant part. Professor Bedson found albumin, sugar, and acetone in the urine of one of my own patients, but no trace of acetone or its congeners in the blood, which, considering the supposed relationship between acetonæmia and diabetic coma, is rather an interesting fact. I should like, in conclusion, to draw attention to a fact of therapeutical interest, and that is the influence which cocaine often has in overcoming the obstinate constipation of diabetes. Where aperients fail, cocaine in small doses (¼ gr. twice or thrice daily) will not only brace up the muscular system generally and remove the sense of fatigue so frequently present in these patients, but act so decidedly upon the musculature of the intestine that its peristalsis is increased and constipation is overcome.

Newcastle-upon-Tyne.

THE OCCURRENCE OF ERYTHROMELALGIA IN DISEASE OF THE SPINAL CORD; AN ACCOUNT OF TEN CASES.

BY JAMES COLLIER, M.D., B.Sc., M.R.C.P. LOND.,

JUNIOR HOUSE PHYSICIAN TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE, W.C.

THE association of erythromelalgia with symptoms indicative of lesions of the central nervous system has been so frequently observed that the opinion of recent observers supports the opinion originally put forward by Weir Mitchell[1] in 1878 when he first clearly described the clinical picture of the condition. He said: "I believe the group of cases now described represent an unrecognised type of spinal or cerebro-spinal disease and that they may be found in the future associated with distinct lesions in definite regions." Lewin and Benda,[2] discussing a series of cases collected from various writers, consider that erythromelalgia was not a disease *sui generis* but generally a symptom of definite disease of the central nervous system or of functional disease. Auerbach and Edinger[3] last year published a case of tabes in which erythromelalgia confined to the right foot was a conspicuous symptom. After death degeneration of the posterior roots of the lower lumbar and sacral nerves

[1] S. Weir Mitchell: American Journal of the Medical Sciences, July, 1878.

[2] Lewin and Benda: Berliner Klinische Wochenschrift, 1894 Band xxxi., pp. 53, 87, 117, and 144.

[3] Auerbach and Edinger: Nervenheilkunde, Sept., 1897.

almost confined to the right side was found. The spinal ganglia and peripheral nerves were thoroughly examined and found to be normal. The degeneration principally affected, in the spinal cord, the tract lying close to the septum on the right side usually described as rising from the upper sacral roots, which were in this case found totally degenerated; the erythromelalgia was confined to the skin areas supplied by the fifth lumbar and first and second sacral roots. Very few cases of erythromelalgia have been reported in this country and it is not recognised as a condition occurring in spinal disease. There seems reason to believe, however, that the condition would be found not infrequently if looked for and may be of great importance in the diagnosis and prognosis of nervous disease.

Erythromelalgia is characterised by acute vaso-dilatation over a definite area of the body. The skin assumes in marked cases an intense purple-red colour, swells a little and becomes tense and shiny. The superficial veins of the affected region stand out prominently. The skin can be felt to pulsate and the surface temperature is raised often as much as two degrees above that in the non-affected regions. Severe burning pain, often described as being like a strong galvanic current applied to the skin, accompanies the redness. When the affected area is analgesic patients experience intense tingling, but no pain. The attacks may appear spontaneously or may be induced by exertion, warmth, or emotion. The effect of position upon the affected region is remarkable, so that when the foot is affected an attack may be often brought on at once by merely allowing the foot to hang down, and during the attack that position always increases the pain and the vascular phenomena. Many cases have been reported in which patients have been entirely unable to stand on account of the pain the erect position produced. Elevation of the affected part always causes the pain and the state of vaso-dilatation to pass off so long as the elevated position is maintained. During the attack the application of warmth to the part affected increases the pain and cold greatly relieves it. The surface temperature of the erythromelalgic skin is raised when the part is dependent sometimes to a remarkable degree and lowered when the part is raised. In a normal limb the reverse is the rule. This effect of position upon the vaso-motor state and temperature of the limb is highly characteristic of erythromelalgia. Tender points are frequently observed over the affected area and hyperæsthesia is common. Localised sweating of the skin during the attack is common and thinning of the skin, with brittle, reeded nails, sometimes occurs. The distribution of erythromelalgia is generally peripheral upon the limbs. Rarely the face and trunk have been affected. The lower extremities are more frequently affected than the upper; the distribution is not that of nerve-root or nerve-trunk—it is often limited by a sharply marked circular line round the limb. As a rule the limbs are affected symmetrically, although frequently one limb is affected before the other. The condition shows a marked tendency to spread until the whole distal part of the limb is affected. The duration of the attacks varies from half an hour to several weeks[4]; it is usually three or four hours. Hæmoglobinuria has not been found associated with the condition. The patients rarely suffer with chilblains or "dead fingers."

I have observed ten cases showing erythromelalgia in different degrees of severity at the National Hospital for the Paralysed and Epileptic during the last six months and I am much indebted to my chiefs—Dr. Jackson, Dr. Buzzard, Dr. Bastian, Sir William Gowers, Dr. Tooth, and Dr. Colman—for permission to publish the following notes.

CASE 1. *Disseminated sclerosis.*—The patient was a woman, aged twenty-nine years, of healthy appearance. The symptoms of spinal cord disease began nine years before admission. On admission examination revealed pallor of both optic discs, slight weakness of both external recti, diplopia, and slight nystagmus. There was no speech defect. There were slight intention tremor of the hands, loss of control of both sphincters, severe spastic paraplegia with some ataxy of the legs, inability to stand, double rectus and double foot clonus, no sensory disturbance, and some hyperæsthesia of the feet. Seven years before admission she noticed attacks of burning pain in both feet associated with great redness and heat. These occurred spontaneously and whenever the feet became hot. The attacks lasted about three hours and were at once relieved during that time by the recumbent posture, but the pain and redness returned when she put her feet to the ground. A year later the feet gradually became permanently red and the dependent position of the legs became an active factor in producing the attacks. Sixteen months before admission the feet always became purple and painful when allowed to hang down. The redness, up to this time confined to the feet, extended as high as the knees. The feet swelled during the attacks and sometimes subcuticular hæmorrhages occurred. The feet and legs were then constantly red in whatever position they were placed. Since this time up to her admission the attacks continued, but less frequently than before. As she lay in bed the legs showed a red blush limited sharply above by a circular line just above either knee, which below the middle of the calves changed to a deep purple colour and over the feet showed some mottling. The feet were cold to the touch and pressure produced an intensely white mark which slowly became red. When the feet were hung over the edge of the bed or when she assumed the upright posture they became of a much brighter purple colour and became very hot to the touch. The skin became tense and shiny and the feet swelled but did not pit on pressure. The veins stood out and the whole foot and leg below the knee could be felt to throb. She had intense burning pain limited to the region of redness. A surface thermometer was applied to the dorsum of each foot for ten minutes, the feet being raised above the level of the body. A second application was made for a similar period, the legs being allowed to hang over the edge of the bed. The temperature in the raised position was as follows: in the right foot 94·8° F., in the left foot 94·6°; in the dependent position, right foot, 96°, left foot, 95·8°; the difference being—in the right foot, 1·2°, and in the left foot, 1·2°. On two occasions while she was under my care I was called to this patient in the night and found her crying out with pain in the legs, which presented a condition of erythromelalgia even more severe than that just described as the result of hanging the legs down and with similar distribution. She was relieved by the application of cold and by bandaging the feet tightly with Martin's bandage.

In this case the following points are of interest. The pain and vaso-motor disturbance always appeared simultaneously. The attacks were at first spontaneous only but subsequently they were often brought on by the dependent position of the lower extremities and lastly always induced by the dependent position. When this patient was wearing tightly applied Martin's bandages from the foot to the knee she could sit with the legs down in comparative comfort. The slow supervention of a gradually deepening permanent vaso-motor palsy, uninfluenced by the position of elevation of the limbs, and occurrence of acute spontaneous vaso-motor disturbance in its area of distribution may have a most important bearing on the pathology of erythromelalgia.

CASE 2. *Disseminated sclerosis.*—The patient was a woman, aged forty years, delicate-looking and sparely nourished. Ten years before admission she had transient amblyopia of the left eye. Her present symptoms dated from a chill seven months before admission. At the time of admission there were pallor of both optic discs, concentric contraction of both visual fields and slight nystagmus on extreme lateral deviation. Speech and the upper extremities were normal; the lower extremities were very weak in all movements. There was marked wasting of the muscles in the left thigh and calf; dorsiflexion of either ankle was impossible; the gait was peculiar and strongly suggestive of functional disease. There was loss of sense of position below the hips. There was no anæsthesia. The sphincters were natural, the knee-jerks were difficult to elicit, and the plantar reflexes were very faint. Four months before admission she noticed sudden burning pain in the feet as she was walking. The pain lasted some time and occurred on several occasions. Soon afterwards similar pain was noticed at night and she thought a very hot foot-warmer was in the bed and asked to have it removed. These attacks frequently recurred. A month before admission the feet became red and painful when she stood up. The recumbent position at once caused the pain and redness to disappear, as did the application of cold. As she lay in bed the feet presented a natural appearance. Directly the feet were lowered typical erythromelalgia was seen in either foot, limited by a sharply marked circular line just

[4] Two cases with attacks of very long duration are reported by Cristiani, La Riforma Medica, Torino, 1894, vol. iv., p. 4.

above the malleoli. At times for days together no vaso-motor phenomena appeared when the patient stood up and at other times the erythromelalgia would appear in one foot only. When the feet were warm to the touch as she lay in bed the vascular phenomena always appeared if the legs were allowed to hang down or if a ligature were tied round the calves. There was no persistent vaso-motor palsy. The soles of the feet and the calves were very tender on pressure. There were no trophic changes. This patient had several spontaneous attacks when in the recumbent position. Subsequently she developed complete paraplegia, reflex flexor spasm, complete anæsthesia below the knees, and loss of control of the sphincters with cystitis. She became completely bedridden and since then the vaso-motor disturbances have not again appeared.

The aspect of this case at first was strongly suggestive of functional disease. The presence of erythromelalgia at that time was much in favour of organic disease. The diagnosis of disseminated sclerosis was fully confirmed by the subsequent course of the illness.

CASE 3. *Disseminated sclerosis.*—The patient was a woman, aged twenty years. Her symptoms began three years ago. When admitted to hospital she had slight weakness of the right arm with marked incoördination and intention tremor, slight incoördination and tremor in the left hand, spastic paraplegia with marked ataxy, no anæsthesia, and loss of control of the sphincters. The knee-jerks were exaggerated, there was double foot clonus, and the triceps and supinator jerks were absent. While in hospital she first noticed severe attacks of burning pain in both feet when they became warm in bed at night, lasting a variable time from a few minutes to several hours. There was well-marked erythromelalgia over both feet limited above by a circular line just above the ankle, that on the right foot being more intense. During the attacks the dependent position of the feet increased all the symptoms and raising the limbs above the level of the body alleviated them, but the dependent position did not seem to be a factor in inducing the attacks. A month after the appearance of the erythromelalgia a condition of permanent vaso-dilatation made its appearance over the same area and gradually deepened in intensity as the attacks went on. Nine months later the attacks became much more frequent; she became quite paraplegic. Since this time the vascular disturbances have gradually diminished and have now been absent for some months.

CASE 4. *Disseminated sclerosis.* — This patient was a married woman, aged twenty-nine years. Her illness began after a confinement three years before admission. On admission she had unequal pupils, transient diplopia, spontaneous rotatory nystagmus, and coarse nystagmus on deviation. Speech was halting and there were slight tremor of intent in the upper limbs and marked incoördination and intention tremor of both legs. All movement of the lower extremities was very weak. Romberg's symptom was present. There were no anæsthesia or girdle sensation. There was reflex incontinence of urine. The knee-jerks were exaggerated, R. > L. There was double foot clonus. The skin over the outer side of the left foot, including the two outer toes, not extending on to the soles and extending an inch above the external malleolus, was of a red colour, sharply marked off from the surrounding skin, which was pale. The whole left leg below the knee showed a curious *tache* not unlike urticaria scripta.[5] At times and for periods of twelve hours together when she stood up the red area above described assumed a condition of typical erythromelalgia and she had severe pricking pain confined to that area. Alteration of position had the usual effect upon the redness and pain. At other times the erythromelalgia could not be brought on by prolonged exertion or by immersing the feet in hot water or by placing a ligature round the limb. The soles of the feet and calves were tender to pressure. She had attacks of severe burning pain in both feet at night, but this occurred only twice while she was under my care and on neither occasion were the feet seen.

The noteworthy features of this case are the distribution of the permanent vaso-dilatation and the *tache*.

CASE 5. *Neurasthenia with (?) disseminated sclerosis.*—This patient was a single woman, aged thirty-four years. Six years before admission she had double oöphorectomy performed for the relief of dysmenorrhœa. The operation was followed by severe neurasthenia. For two years she had been unable to walk or sit up and for the last year there had been slight trouble with micturition. All movements of the limbs were executed feebly and languidly. There was no wasting, tremor or ataxy. She could not sit up in bed and when she attempted to stand she fell "all of a heap." There was distinct left hemianæsthesia and occasional slight delay in micturition. The plantar reflexes were absent and the knee-jerks were brisk. There was left foot clonus. The nails of the fingers and toes were thin, reeded, and brittle; the skin of the hands and feet was soft and thin and perspired profusely. Three years ago she began to have attacks of pain in the hands and feet; sometimes in the hands only. They occurred at night, lasting some hours, and she got into the habit of sleeping with the hands above her head to lessen the pain. Soon after this time she noticed that the dependent position of the limbs brought the attacks on and she had been unable to put her feet to the ground for weeks together on account of the pain. The attacks were accompanied by excessive tenderness and profuse sweating of the hands and feet. They were much better in the winter than in the summer; often in the winter she had gone months without any attack. On examining this patient one morning I discovered a slight degree of erythromelalgia in the left foot. This had passed off by the following day and for the next month she showed no sign of the condition, though I repeatedly tried to induce it. At the end of this time I was called to her one morning and found her crying out with pain, a severe condition of erythromelalgia being present, limited in the hands by a line round the forearm an inch above the wrist and in the feet by a circular line just above the ankle. The left foot was more affected than the right. The hands and feet were perspiring profusely and she complained of a pain as if she were being burnt in the balls of the fingers and toes. Pressure over the heads of the metacarpal and metatarsal bones on the ventral aspect gave great pain. The effect of position and of the application of cold was typical. The following was the surface temperature taken on the dorsum of each hand: hands straight up in the air—right 88·4° F., left 88·6°; hands hanging down—right 90·6°, left 90·8°; the difference being, right 2·2°, left 2·2°. During the remainder of her stay in the hospital these phenomena appeared unvaryingly when the feet and hands were dependent and some degree of vaso-dilatation was constantly present over the areas affected by the erythromelalgia. In this case the erythromelalgia was the earliest organic symptom to make its appearance and together with the sphincter trouble and foot clonus of later onset suggest strongly the presence of organic spinal disease. In connexion with the oöphorectomy it is interesting to note that in several published cases in males erythromelalgia has been associated with aspermatism.

CASE 6. *Disseminated sclerosis.*—The patient was a woman, aged thirty years. Her symptoms had been present for five years. On admission she had concentric contraction of both visual fields, slight left ptosis, some weakness of the right external rectus, nystagmus, slight tremor on execution of fine movements in the upper extremities, severe spastic paraplegia with ataxy, loss of muscular sense in the lower limbs, partial anæsthesia of the legs, and loss of control of the bladder; the knee-jerks were exaggerated and there was double foot clonus. For the last two years she had had attacks of a burning and uncomfortable but not painful sensation in the neck and ears, associated with great redness and heat of the skin. The attacks always occurred when she was recumbent and were brought on by motion. The skin over the whole neck as low as the clavicle and over the whole head, excluding the area of distribution of the fifth nerve, during these attacks became of a red colour, very hot and slightly swollen. The attacks lasted about half an hour.[6]

CASE 7. *Tabes dorsalis.*—The patient was a man, aged thirty-one years. He had had syphilis nine years ago. The symptoms had been present for two years. He had unequal Argyll-Robertson pupils, incoördination of movements of the upper extremities and complete loss of muscular sense in the three ulnar fingers of both hands, tactile anæsthesia and partial analgesia below the sixth cervical root distribution, absolute analgesia below the third lumbar root distribution, lightning pains, girdle sensation, absolute loss of muscular

[5] A similar condition occurring in association with erythromelalgia is reported by Senator, Berliner Klinische Wochenschrift, 1892, Band xxix., pp. 1125-9.

[6] A case of tabes with similar distribution is reported by Benda, Berliner Klinische Wochenschrift, 1894, Band xxxi., pp. 53, 89, 117 and 14

sense in the legs, Romberg's sign, and absent knee-jerks; there was no sphincter trouble. He had noticed for two months that the feet and legs as high as the knee became red, swelled and tingled all over when he tried to walk or when he was sitting with legs down and that sometimes they became very red and tingled when he was in bed. There was a typical condition of erythromelalgia over both lower extremities, gradually becoming less marked from below upwards and ceasing just above the knee. This varied much from day to day, at times being more severe, at others hardly noticeable or absent. Surface thermometry gave the following results: legs horizontal — right foot 85·6° F., left foot 89°; legs dependent — right foot 86·6°, left foot 90°; the difference being, right foot 1°, left foot 1°. (A Hicks' thermometer was applied to the dorsum of the foot for ten minutes in each case.) There were no trophic changes, no sweating, no tender points, and no persistent vaso-motor palsy. Whilst under observation he had severe gastric crises; during several of them attacks of erythromelalgia in both hands limited sharply at the wrists were seen, but the attacks were accompanied by tingling and not by pain, the absence of which in both hands and feet during the vascular disturbance is to be explained by the fact that both regions were analgesic.

CASE 8. *Tabes dorsalis.*—The patient was a man, aged fifty-two years. He had had syphilis twenty-five years ago and had had two attacks of lead colic. On admission he had unequal Argyll-Robertson pupils, incoördination and loss of muscular sense in the arms and legs, Romberg's sign, marked anæsthesia and analgesia below the sixth cervical root distribution (the anæsthesia splitting the middle finger), which become almost absolute below the tenth dorsal level; lightning pains, girdle sensation, severe gastric crises, and delayed micturition. The knee, wrist, and elbow jerks were absent. There was alopecia over the fifth lumbar and first sacral root areas. The skin over the feet was thin and shiny and the nails were brittle and reeded. A history of erythromelalgia was carefully inquired for with negative result. After he had been under observation a month one morning he had an attack of severe gastric pain and went to bed. Immediately afterwards both hands assumed a deep purple colour and felt as if they would burst. They tingled all over, the veins stood out, and the whole hands throbbed. The skin became very tense and swelled slightly. The redness was sharply limited above by the flexure of the wrist on the radial side and extended for 2 in. above the wrist on the ulnar side. It was quite symmetrical. Raising the hands above the head caused the redness and tingling to disappear; lowering the hands caused the symptoms to reappear and become intense. The following are the surface temperatures. Hands raised above the head—right 89·5° F., left 89·5°; hands hanging vertically—right 92·5°, left 92·5°; the differences being, right 3°, left 3°. The attack lasted three hours and for six hours after it had passed off some degree of erythromelalgia could be produced by allowing the hands to hang down. Up to the present time this patient has had no further attack. In this case, as in the last, the vascular disturbance was situated in an analgesic region and tingling appeared in the place of pain. In both cases the vascular and gastric crises appeared simultaneously.

CASE 9. *Myelitis.*—The patient was a man, aged thirty-five years. His symptoms began gradually in February, 1896. When this note was made he had severe spastic paraplegia with ataxy and reflex spasms, partial loss of sensibility from the xiphoid cartilage downwards and delay in micturition; the knee-jerks were exaggerated and there was double foot clonus. At Christmas, 1897, he first noticed attacks of burning pain in the feet associated with redness and heat. The attack occurred almost every night and he constantly required injections of morphia to ease the pain. There was a condition of marked erythromelalgia over both feet limited sharply at the middle of the calf. It varied greatly in degree at different times. Subsequently this patient recovered such power in the legs as to enable him to walk. The attacks still occur when he walks about much but are much less severe than formerly.

CASE 10. *Traumatic neurasthenia.*—The patient was a man, aged twenty-five years. His symptoms followed a severe fall on to his back fourteen weeks before admission. On admission all movements of the lower limbs were performed feebly and with much coarse tremor; there was no rigidity and no wasting. He trembled all over when he tried to walk and frequently dropped on his knees. His gait was typically functional. There was intense tenderness over the last lumbar spine but no abnormality in the spine or pelvis. There was absolute analgesia and diminished tactile sensibility over the lower extremities below Poupart's ligament on either side. He had slight difficulty in starting the act of micturition. The knee-jerks were exaggerated and there was double foot clonus. While in the hospital this patient for the period of a fortnight had several attacks of erythromelalgia of slight degree, the distribution being from the knee downwards and quite symmetrical on the two sides. The redness was not sharply limited above but faded off gradually into the normal skin. The attacks, which occurred several times a day and lasted about two hours, became slighter and disappeared at the end of a fortnight. I have since heard that they have returned.

This case was without doubt chiefly one of traumatic neurasthenia, but the existence of slight sphincter trouble and persistent foot clonus suggested that there was some lesion of the spinal cord. The occurrence of erythromelalgia strongly supported the probability of this.

The occurrence of these cases within a short period of time argues that erythromelalgia is not a rare symptom of spinal cord disease. It has without doubt frequently been overlooked. In the absence of symptoms pointing to the disease of the nervous system erythromelalgia has been investigated as an entity and the earlier literature on the subject relates chiefly to "idiopathic" cases. Lannois[7] in a collection of cases published before 1880 states that nervous symptoms are only rarely coincident. The prevailing opinion at the present time among German writers is the opposite extreme to this. When a case presents as one of definite disease of the nervous system, erythromelalgia, if it occur, may not be recognised as such and may be simply noted as "vaso-motor paralysis," the accompanying sensations being set down to some of the many subjective peripheral sensations occurring in spinal cord lesions. One of its most characteristic symptoms—pain—may be absent if there be analgesia, as was the case in the two tabetic patients cited. Again, the variability of the occurrence of the symptoms—often absent for long periods together, especially in patients who are confined to bed—renders it easy to be overlooked. I would suggest that if the symptom be looked for with a knowledge of the peculiarities distinguishing it from other forms of vaso-motor paralysis it will be found not uncommonly in disease of the spinal cord.

In several of my cases there occurred at first only spontaneous attacks; afterwards the conditions became frequently induced by the dependent posture, and later a condition of permanent vaso-motor palsy of greater or less degree made its appearance; the attacks meanwhile continuing. This sequence suggests an irritative lesion of nerve structures governing the blood-vessels being the cause of the vascular crises and of the progress of this irritative lesion to a partially destructive lesion being the cause of the persistent vaso-motor palsy, these phenomena in vaso-motor nerve elements being parallel with pain followed by anæsthesia in sensory nerve elements and with spasm followed by motor paralysis in motor elements. Weir Mitchell used the term "vascular storm" in reference to this condition and the term "vascular crisis" would, I think, be very apt, occurring as it does in tabes associated with gastric and other sensory "crises." Probably the same fundamental pathological processes underlie both sensory and vascular crises. In all my cases the vascular change was never preceded by the sensory disturbance, but either preceded it or the two appeared simultaneously. It seemed as if the sensory disturbance was a local result of the altered vascular condition of the part. I would lay stress on the fact that erythromelalgia may be the first symptom of organic disease of the cord and may be of great value in diagnosis and especially valuable in the differential diagnosis between functional disease and disseminated sclerosis.

[7] Lannois: Sur Erythromelalgie, Paris, 1880.

DRAINS AT BODMIN.—At the meeting of the Bodmin (Cornwall) Rural District Council held on July 30th a complaint was made of an open drain at Port Isaac, whereupon a member remarked that personally he did not believe in drains, and added that there was no plague in Bombay before drains were made. Eventually it was decided to instruct the police to report persons throwing slops into the drain.

VITALITY:
AN APPEAL, AN APOLOGY, AND A CHALLENGE ADDRESSED TO BROTHER PRACTITIONERS.

BY
LIONEL S. BEALE.

BIOPLASM.

(Continued from page 144, July 16th.)

ESPECIALLY in warm-blooded animals bioplasm loses its characters soon after death. It becomes liquefied, there being no doubt a minute coagulum at the moment which soon undergoes further changes. The fluid which constitutes the greater part soon permeates the tissues around and the water and dissolved constituents are diffused through the adjacent textures, which, of course, become flaccid and lose the firmness and resilience characteristic of them in the living organism and for a short time after death. Generally, the constructive and formative agency of bioplasm deteriorates if the bioplasm lives too fast—if the rate at which nutrition and multiplication proceed in the normal state of health is much exceeded—and if this increased rate of living does not soon cease all formative and constructive power is entirely lost, the rate of multiplication increases, and such is the intensity of the nutritive process that the living particles acquire yet increased powers of multiplication and may live at the expense of and destroy the very tissues which had been produced by the bioplasm from which they also traced their descent.

This same process of rapid growth and increased multiplication in low simple forms of life results in mere increase in numbers, though even in this case there may be some change—some deterioration in vital power. But generally in the case of the lower microscopic fungi and allied organisms favourable external conditions and plenty of nutrient matter cause greatly increased and more rapid multiplication only.

But in the case of man and many of the higher animals if the bioplasm of the tissues grows and multiplies at a rate which considerably exceeds that which is normal, as occurs in "inflammation and fever," it very soon loses its tendency to produce bioplasts having normal formative power and soon "pus corpuscles" may result. Thus the vital biological process is soon replaced by a vital pathological process. So numerous are the bioplasts produced that they may fill the surrounding spaces amongst the tissues. Such phenomena are of great interest to us and illustrate principles in action through nature that deserve more consideration in pathology and medicine than they have yet received. The living descendants of normal bioplasts which had living formative capacity are represented by "pus corpuscles" injurious to the organism in which they originated. Evanescent and short-lived, they soon become a prey to bacteria and other low forms of life and are lost.

When, on the other hand, the bioplasm of our tissues lives too slowly a low kind of formed material is produced which in many characters departs from the normal standard. This may gradually accumulate so as to interfere with action and in many cases with the removal of the substances formed during action; and, again, a pathological change of a kind very different from normal biological changes and also from those resulting from living too fast is the consequence, but slow deterioration and incapacity succeed.

In the lower forms of life, as in the case of the microscopic fungi, when the conditions are unfavourable and nutrition and multiplication proceed too slowly the bioplasm ceases to grow and much is converted into hard formed matter by which the speck of bioplasm that is left is protected from injurious influences and is thus enabled to live through a long continuance of adverse conditions. Not only so, but the living particle, however minute it may be, during its comparatively passive state seems to acquire and accumulate vast vital power of its low simple kind, for after living apparently dormant for months, when favourable conditions of temperature, moisture, &c., are established, the thick protective covering is soon softened and permeated by nutrient matter. The enclosed bioplasm soon increases, portions of it burst through the walls which enclosed it, pass out at any weak spots and soon gain the outside, when at once it lives freely, increases and multiplies exceedingly and in a wonderfully short time, and then growth and multiplication proceed in the usual manner.

Generally, the production of bioplasts which are to take part in the production of bioplasts which are eventually concerned in the formation of highly complex tissue and various formed substances, is a slow process. Vital phenomena requiring but a very small quantity of matter proceed in the bioplasm of every bud during a long time in the dark and cold part of the year, when as we say vegetation is at rest or asleep; but all this time the bioplasm is gaining in power—vital power is as it were accumulating or concentrating. The early vital changes, and the arrangement of the bioplasts of the plant bud from which the tissues of leaves, flowers, and fruit are eventually evolved, is a slow operation indeed compared with the growth of these; until the development of the bioplasts and their orderly arrangement are slowly completed active growth does not begin.

The evolution and development of the active part of the ovum and seed are slower and still more wonderful as regards the concentration of developmental and formative power not to be actively manifested until a considerable period of time has passed, the bioplasm of course being in living state and probably undergoing important changes during the whole time in preparation for the wonderful and often rapid increase and growth with which all are familiar.

According to the notions of our time we might say that we may hold alive in the palm of the hand the potential future forest. The potential part of the germ of animals and man having its wonderful powers of evolving many kinds of tissues and organs of great complexity and perfect action, is so minute that probably that of the largest organism that ever lived on earth or in the water was considerably less than the head of the smallest pin. Verily, it is indeed difficult to understand how anyone can regard matter and its physico-chemical changes as all in all, and almost ignore the existence and operation of vitality that governs, directs, and determines the changes which the matter is to undergo.

That throughout living nature, from the time of the first appearance of life, all arrangements and actions of tissue, however complicated or inexplicable, have been a direct consequence of the influence of the vital power of the bioplasm and have resulted from changes before the formed material was produced and manifested its characters, may be regarded as certain. The facts prevent the acceptance of any other conclusion. Surrounding conditions undoubtedly exert a modifying influence, and in more than in one or two characteristics, but are incompetent to give rise to any vital changes whatever. They may check, stop, or, on the other hand, may facilitate the activity of vital phenomena. They may interfere with the completion of the series of already arranged-for changes. As some would say, external conditions may affect the evolution of an individual, a species or a race, and in many ways; and, on the other hand, may stop and indeed often do stop evolution altogether and put an end to life.

By studying the growth and arrangement of a tissue we may mentally trace the different stages of its formation, as it were backwards, until we reach the colourless, structureless bioplasm in which it originated—nay, when we see impression of its structure we may sometimes decide the general nature of, if we cannot actually identify, the organism from which it was derived, just as from the footmarks upon a slab dug up yesterday after it had been lying buried undisturbed for ages we may feel sure as to the sort of foot which made the impressions at the time of a living world, very different from our life world, and of which but a few traces are still to be seen in a small number of living organisms of the living world of our time, so marvellously different from those referred to of past ages, though in unbroken continuity with it and at least certain forms of its far remote living matter. Not only so, but those familiar with anatomy and the structure of tissues may, from the character of the imprints, form some notion of the characters of the tissues of that primeval foot, of the muscles by which the toes were moved, the tendons by which they were connected with the bones, and the nerves distributed to the tissues. Further, the sort of legs, the body they supported, and even the habits of the creature and many other facts connected with its existence may be surmised. The minute structure of its tissues, the changes which occurred in their formation, the general character of its living matter, are now as certain as that the sun whose rays light our earth at this moment is the same sun that rendered possible those imprints made æons ago, and the reason becomes convinced that long ere those primæval times the same principles prevailed then as regards the vital phenomena of that

so-called extinct living world as prevail now, and over all the same Infinite Power that was and is and is to be.

By the careful examination of the complex arrangement of nerve plexuses and networks in many parts of the organism we may form some idea of the movements of the bioplasts at a very early period of development long before a trace of the fibres and nerve trunks was to be discerned. For this purpose it is better to take a small animal than a large one—the little green tree frog, Hyla, a young white mouse, or a bat. The tissues of these animals are delicate but make beautiful specimens, and there is very little indefinite connective tissue to prevent us getting a clear view of the course and arrangement of the delicate nerve fibres in many parts and organs. That specimen showing the spiral arrangement of one of the fibres of a nerve cell from the Hyla figured in my drawings[1] and copied into many works demonstrates several general points connected with the arrangement of nerve fibres of great importance, though very different conclusions have been entertained with regard to the structure and action of such remarkable nerve cells. The fibres—one straight from the central part, the other spiral from the circumference of the body of the cell—may be traced to a point a short distance from the cell where one curves round the other fibre, so that they pursue *opposite directions* in the bundle of fibres with which they run. These and other points are referred to in my paper in the Philosophical Transactions of the Royal Society for 1863, Part II., p. 543.

Another example of the demonstration of a particular fact bearing upon important general questions, occurs in a specimen also from the Hyla in which a delicate nerve fibre can be followed from the fibre connected with it to its distribution on a capillary vessel, and its course may be traced for some distance near the outline of the vessel, which is also distinct. Upon comparing both these specimens with the drawings made on the wood blocks many years ago and afterwards engraved line for line, the correctness of the figures published in 1863 may be confirmed, and I think I am justified in saying that it is not easy to draw conclusions widely different from those I have arrived at concerning the arrangement depicted. These specimens were examined early this year by Dr. Alexander Morison.[2]

Now the facts alluded to do not accord with some of the first principles of nerve distribution and nerve action which are entertained. Both specimens it need scarcely be said have some bearing upon the questions of nerve distribution, nerve ends, and nerve circuits which lie at the root of the problem of nerve action.

Notwithstanding the thousands of miles of type being constantly set up an English biologist has, indeed, very little chance of gaining the attention of the numerous active students of biology of the last decade or two either here or in other parts. I may be permitted to remark with regard to many recent observations concerning the arrangement of nerve cells and nerve fibres that the general conclusions of some good observers appear to be coming rather near to some of those represented in my drawings published about forty years ago. In particular as to the connexion of at least two nerve fibres with every nerve cell, while "apolar" nerve cells seem at last to have been given up. Then the "nerve ends" seem to be gradually extending themselves farther and farther from the "nerve cells," both central and peripheral, and I begin to look forward in hope to the time of still more extensive fibre elongation, and even some day to the admission of nerve circuits, structural continuity between "cells" and fibres everywhere, and uninterrupted tissue communication between all seats of nerve action in distant parts and central nerve cells. I look forward to the exposition of the development of the nerve systems of all organisms which possess them, from structureless bioplasm, and the explanation of the mode of working of every part of the most complex and elaborate nerve tissue arrangements in living nature. Few observers seem to venture to give an opinion on the question of action of the arrangements they describe. The anatomical distribution of the fibres and the general anatomy and distribution of the nerve fibres—indeed, the whole nervous system of man—is gradually being reduced to form and order by dissection, by experiment and microscopical observation, and by careful investigation of various cases of disease, especially where the pathological changes are restricted to particular parts of the peripheral and central portions of the nervous system. But still many first principles remain undetermined and we have yet much to learn concerning the minute structure and action of the simplest central and peripheral nerve arrangement, of the precise action of nerve cells and the origin, nature, and mode of transmission of nerve currents. Criticism in this department to be of value to us must be careful and thorough. So far few attempts have been made to collate the multitudes of observations and views of the many workers and thinkers in this important department of knowledge so very closely connected with a knowledge of human action in health and disease.

I long to go further and think I could climb higher, much higher, and yet not reach the last rung of the strong ladder of observation and demonstration, particularly as regards this arrangement, development and action of nerve fibres and nerve "cells," but for the present forbear, for I fear I have already exhausted the patience of my readers with descriptions of minute anatomical details, their meaning and the manner in which they were produced, though so far I have described only what I have demonstrated and can show to others. The conclusions I have arrived at are, I believe, the only inferences that are reasonable and I believe the evidence to be convincing that all growth, all structure, all formation, are determined by vital action and depend in the whole living world upon vitality. Above all things, I desire that the attention of my readers should for the present be concentrated upon the consideration of this most important question—the existence of vitality as distinctive of the whole living world—peculiar to it and not representing or analogous to anything else in nature. If the conclusions at which I have arrived are wrong, scientific men who differ from me and teach totally different views ought to expose my errors and state the grounds of their objections. As regards all living matter being due to vitality, to the uninterrupted action of vital power operating in everything living, but in the living world only, I submit the following conclusions based upon facts of observation and expressed as clearly and in as few words as possible.

Everything living, the whole living world, past as well as present, was first in the state of colourless structureless living matter—bioplasm.

Some of the lowest forms seem to be structureless during the whole period of life; and all during the earliest stages consist of bioplasm with no discernible formed material or structure.

However complex and elaborate may be the structure of the highest organisms in the fully developed state, all were originally bioplasm or structureless living matter—were evolved from this. Without bioplasm evolution of any kind is impossible.

Every tissue, every structure, every organ is formed from and by the structureless bioplasm, and as far as is known there is no other mode of formation in living organisms.

Bioplasm manifests powers not possessed or exhibited by matter in any other state or under any other known circumstances or conditions—powers of directing, moving, governing, re-arranging material particles — powers of analysis and of preparing for synthesis—powers of preparing for and providing for, and as it were foreseen, future changes and developments. These wonderful powers, as it seems to me, can only be accounted for by attributing them to some power or influence operating in every living particle, but in the living world only—vital power, vitality—Biokraft—"a psychical factor, a factor which no physical research whatever can disclose or identify or get the remotest glimpse of" (Herbert Spencer).[3]

[1] Philosophical Transactions, 1863.

[2] See report of Dr. Alexander Morison's "Morison Lectures," Edinburgh Medical Journal, February, March, April, 1898, p. 228.

[3] Not a little confusion has of late years occurred in the use of the word "psychical," some having extended its meaning and so generalised it until it is made to include those phenomena in all life which distinguish it from all non-life, and which by me have been termed "vital," while by many the word is still restricted to *mental phenomena*. In my view all mental action is "vital" action, but I do not consider all vital action to be "psychical." The "psychical actions" of a bacterium, of a monad, of an entozoon seem hardly admissible unless the word is to be substituted for "vital" in all cases. It has been ingeniously suggested that mental psychical phenomena have a *physical* as well as a *psychical aspect*—a double-faced system, but whether the physical or the psychical begins it, or both begin together, has not been stated.

If the ordinary phenomena of life can be explained without postulating any such "psychical factor," why have they not been so explained? What facts or laws, properties, processes, or energies expel vitality from living nature?

Every complex living organism consists of living matter or bioplasm and of formed material or tissue and other formed matters.

Every kind of structureless, colourless living matter in nature is associated with a large proportion of water. In the absence of water life exists not.

The living matter in fully formed organisms is inconspicuous and in specimens prepared by some methods is not seen at all.

Every particle that lives consists of: (*a*) living matter; (*b*) matter that has lived; and (*c*) matter which is about to live—matter about to be taken up by the living matter.

All growth, all formation, all structure and action, depend upon living matter.

Vital power is only imparted to non-living matter when it is infinitely near matter that lives and does not appear to exert any influence upon matter separated only by the very slightest space.

The "nutrient substances" dissolved in a large proportion of water seem to pass into the very centres of the particles of living matter where certain of the constituents are caused to live.

Bioplasm or living matter invariably proceeds from bioplasm that existed already.

Bioplasm cannot, as far as is known, come from the non-living and there is no gradual change from one state to the other.

All vital phenomena are absolutely different from any physical phenomena.

Bioplasm cannot be produced artificially.

It is probable that from the very beginning living matter exhibited the same general characters it exhibits to-day—always was and will be transparent, colourless, structureless, possessing spontaneous vital movements and analytical and formative power.

In all living matter then there is power or capacity of rearrangement of the constituents in a predetermined manner so that special substances and special structures shall result when the matter ceases to live.

I am quite ready to publicly admit mistakes if my observations can be proved wrong, but I have been so many times over the same ground and have examined the corresponding structures and their arrangement and studied their growth and formation in so many different organisms that I cannot believe my general conclusions as to vitality, the nature of growth and formation of tissue, are far from the truth.

I also hold strongly to the general arrangement that I have described of the finest nerve-fibres centrally and peripherally. I have been unable to satisfy myself of the existence anywhere of nerve ends or of central "cells" destitute of fibres or having the one fibre only. And surely by this time we ought to have been able to decide upon many such elementary questions of fact, involving as they do principles of the highest importance, not only to science, but to general knowledge—questions which now have to be referred to even in general education and are perhaps about to be subjects included in "secondary education."

Is it not extraordinary that even during the last half-century many trained scientific minds, notwithstanding the greatly increased advantages we enjoy of being able to penetrate far more deeply into, and to study with greater accuracy, the mysteries of the living world, should, like the natural man of old, have been more interested in the consideration of the tremendous destructive phenomena of the vast and remote non-living rather than in the wonderful if less conspicuous phenomena of living nature—of that living world in which we occupy the most important place, far apart from, if not above, and in a category distinct from, that which includes every other living form? This very small but beautiful and elaborate life-world even now seems to appeal to the general science of our time far less decidedly than the crashing, crushing, terrifying, life-destroying energies of non-living, unapproachable, ineffable immensity.

(To be concluded.)

A CASE OF COMPOUND FRACTURE:

ACUTE TRAUMATIC GANGRENE; AMPUTATION; INJECTION OF ANTISTREPTOCOCCIC SERUM; RECOVERY.

By W. SOUTHEY WRIGHT, B.A. Oxon., M.R.C.S. Eng., L.R.C.P. Lond., L.S.A.

THE following case may, I think, be of interest partly on account of the frightful rapidity with which gangrene came on and partly because of the undoubted efficacy of the antistreptococcic serum in helping to arrest its spread in the stump after removal of the limb.

The patient was a little girl, ten years of age, who fell from a swing near a disused fowl run, sustaining a compound fracture of both bones of the forearm. This happened on May 25th, 1898. I saw her about half an hour after the accident. The wound was not bleeding then although the cloths which had been put on and her clothes were soaked with blood. I washed the wound, through which both bones were projecting, with carbolic lotion and covered it with antiseptic dressings and put the forearm up in back and front splints and left it in the extended and supine position. The patient, a very nervous and excitable child, had borne the necessary manipulations well. On calling next morning I found that she had passed a very bad night. She had been feverish and sometimes delirious. Her temperature was 102° F., her pulse was very quick, and she was wandering. I took off the splints and examined the wound. It was apparently healthy and free from smell and the arm was in fair position. It was again put up antiseptically, but the same night I was called in about 9 o'clock when I found that she had been wandering all day and the bandages were soaked by a thin, bad-smelling discharge; the edges of the wound looked slightly ashy in colour and the wound seemed larger. The bones being very much out of position owing to her restlessness I thought it best to again apply the splints, having first thoroughly cleansed the wound. The next morning (the 27th) I was horrified to find the hand and wrist below the wound quite cold and black and crackling with foul gas, while the whole arm above was swollen and brawny and of a dusky redness which ended in a well-defined raised margin about on a level with the anterior axillary fold. I had the arm immersed in an antiseptic bath and I telegraphed for Mr. Tubby. He arrived in the afternoon and decided on immediate amputation. The difficulty was as to site. The red line was spreading fast and was then close up to the shoulder and it was a question as to whether an amputation through the arm below this point, necessitating as it would the use of flaps which had been already largely invaded, would be preferable to amputation at the shoulder-joint. As the case stood then either seemed a forlorn hope, and while the operation at the shoulder-joint would give a slightly greater amount of healthy tissue for flaps, yet the greater wound surface, the more serious nature of the operation, the infinitely greater deformity should the patient survive, and the very slight hope of survival determined Mr. Tubby to perform an amputation through the arm. We hoped that the tissues of the shoulder would have sufficient vitality to arrest the onward march of the microbes thus cut off from their bases of supply. The limb was removed by the circular method, Dr. Gripper kindly assisting us. We found the tissue slightly healthier than was expected. The artery was quite healthy but there was pus in the vein. The flaps were drawn together loosely to allow of free drainage and the stump was enveloped in iodoform dressings. At Mr. Tubby's suggestion we sent for some antistreptococcic serum, 60 c.c. of which were obtained, and at 12.30 on the same night I went down to inject it. I found the patient, who was taking brandy freely, quiet and rational. The temperature was 99°

and the pulse was 108. On examination I found that the red line had advanced since the operation over the point of the shoulder and although perhaps not quite so prominent was yet well defined, while the redness in the axilla had crept down over the ribs. I injected 10 c.c. of the serum into the shoulder just outside the reddened area. On arrival next morning I was delighted to find that this edge had become ill-defined, blotchy, and irregular with rose-coloured processes, some of which extended beyond the point of introduction of the needle, but on the whole the advance seemed broken, while the shoulder itself was much more soft and elastic. The axillary redness was still spreading downwards, so another injection of 10 c.c. was made just within the margin of it. Altogether 50 c.c. of the serum were injected into the affected area and certainly seemed most potent in arresting the spread of the gangrene. No ill effects seemed to follow the injections, an irritable papular rosy rash around the points of insertion of the needle being the only reminder of them, while three or four days after the last injection a rash, consisting of large rose-coloured circular spots, not elevated, and disappearing on pressure, broke out over both buttocks but soon disappeared. The further progress of the case was most favourable, our only anxiety being caused by the passage of clay-coloured stools and bilious urine, but these symptoms soon passed off and no other complications ensued. The temperature never rose above 100° and the only discharge from the wound was a thick mucoid material, inodorous and easily removed, while the wound itself never gave me a moment's anxiety. The patient is now quite well and has no pain in the stump, which is at present quite healed.

The cause of the gangrene we attributed to the bacillus of malignant œdema picked up from the soil, but an examination of some discharge by the Clinical Research Association only revealed the presence of streptococcus longus. I am bound to say, however, that the specimen was sent to them rather late and that then the amount of discharge sent was not enough altogether to exclude the malignant bacillus as the prime cause of the evil. On the other hand, no one who closely observed the effects of the injections could, I think, have failed to notice how very marked they were. Whether the further progress of the gangrene in the stump would have been arrested without their aid it would be difficult to say, but I feel quite convinced that without them there would have been a far greater loss of tissue and that the fair length of stump which the patient now possesses would have been very much less, if not altogether destroyed.

Carshalton.

EXCISION OF THE CÆCUM FOR TUBERCULOUS DISEASE.

BY H. A. LEDIARD, M.D. EDIN., F.R.C.S. ENG.,
SURGEON TO THE CUMBERLAND INFIRMARY.

IN July of last year a man was admitted to the Cumberland Infirmary on account of a hard swelling in the right inguinal and hypogastric regions. The age given was sixty-three years, but the appearance suggested at least seventy years. Deafness and hebetude no doubt prevented much historical record beyond the fact that the patient had been ill for eight months and suffered from looseness of the bowels. The swelling was within as well as beneath the parietes and showed no mobility. The first impression was that a malignant tumour was present and no idea of surgical interference was entertained. A rise of temperature, however, occurred and the area of the tumour showed a reddened patch. On August 1st an incision was made and some pus was evacuated and at the same time a piece of the indurated abdominal wall was cut away for examination. The pus appeared to come from the direction of the cæcum, but the incision was made near the middle line and below the umbilicus. The wound was stuffed with gauze and the temperature fell, but in a few days faecal matter soiled the dressing and it became clear that the tumour was connected with the bowel. Microscopic examination of the piece cut away threw no light upon the nature of the disease. A sinus now led from just below and to the right of the umbilicus towards the anterior superior iliac spine and pus, with occasionally fæcal matter, escaped. Towards the end of the year the patient suffered from chronic bronchitis, mitral disease, emaciation, and great prostration, so much so that further interference was not countenanced. On Dec. 29th the sinus was laid open and traced down to the cæcum, which organ was found adherent all round, and having thick and hard walls. The cæcum was liberated and cut away and the ileum was attached to the wound, whilst the lower end of the colon was closed up. The sinus was scraped out and stitched up. At the completion of the operation I was in doubt as to the nature of the disease, but the extensive ulceration of the mucous membrane of the bowel and the hard and thickened walls suggested malignant disease. Much collapse followed the operation, indeed the removal of the cæcum was somewhat questionable on account of the patient's frailty, but the wound healed easily enough in spite of the mess occasioned by the discharge from the artificial anus. Microscopic examination by experienced hands showed the disease to be tuberculous by reason of the presence of giant cells and areas of caseation. Contrary to expectation the patient lived until Feb. 20th, 1898, but his feeble condition never would have justified an effort to anastomose the small with the large bowel and so close the artificial anus. Nevertheless it would have been better to have tried to do this at the time of excision of the cæcum because the patient exhibited a remarkable tenacity of life even in his feeble condition.

My reason for contributing this brief abstract of the case is through my having seen in THE LANCET[1] reference to the surgical treatment of intestinal tuberculosis. The disease may be more commonly met with than I am aware of, but it is the first case which I have been called upon to treat; on the other hand, cases of cancer of the cæcum have been dealt with by excision by Bruce Clarke, Walter Edmunds, Marmaduke Sheild and others with success, and it is probable that similar results may be recorded in future for tuberculous disease. To others it may be somewhat encouraging to know that a most unpromising subject for surgical measures survived a resection of the cæcum for two months and might have done still better if sufficient courage had been forthcoming to unite the small with the large intestine immediately after resection.

Carlisle.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTES OF A CASE OF ANGINA LUDOVICI; OPERATION; RECOVERY.

BY ARTHUR E. PHILIPPS, M.R.C.S. ENG., L.R.C.P. LOND.

THE patient, a man, aged forty-five years, of temperate habits, consulted me on May 8th, 1898. He gave the following history. During the previous week he suffered from what he described as the "jaws ache," accompanied with occasional stiffness in the submaxillary region on the left side. He was also subject to hot and cold sensations. On May 7th he noticed a swelling in the left submaxillary region and felt that his tongue was being pushed up towards the roof of his mouth. He applied a poultice to the swelling, which increased very rapidly indeed. There was no history of sore-throat. The next evening (the 8th) I was called to see him. There was an indurated brawny swelling filling up the left submaxillary region extending anteriorly to the middle line, posteriorly to about 1 in. beyond the posterior border of the sterno-mastoid, and superiorly to the malar bone, sharply bounded by entirely unaffected tissue. There were parts locally softened and pitting on pressure. Any attempt to open the mouth caused great pain and on this account it was quite impossible to examine the throat. The floor of the mouth consisted of hardened deeply congested tissue and there was a bolster-like swelling round the interior of the lower jaw. The tongue was normal. He

[1] THE LANCET, July 30th, 1898, p. 274.

could not swallow anything whatever, being obliged to put milk into his mouth and allow it to run down his throat, and he had great difficulty in speaking. He stated that he was unable to sleep for more than a few minutes at a time. There was no albuminuria. The pulse was 96 and the temperature was normal. On the 9th I saw him early in the morning and found that the swelling had extended in all directions except downwards, almost closing the left eye superiorly and beyond the middle line anteriorly. I anæsthetised the patient with A.C.E. mixture and made a deep incision in the submaxillary region. The anæsthetic was taken very badly. The wound was plugged with carbolic gauze and dressed with hot fomentations. On the 10th, with the aid of an anæsthetist, I made deep incisions in the middle line and along the anterior border of the sterno-mastoid; a thin, dark serum exuded. Both wounds were plugged as before. The patient steadily improved, though suffering from bronchitis following the anæsthetics. On June 1st the median incision and that at the anterior border of the sterno-mastoid had almost healed up, but the tissue around the submaxillary incision had broken down and a large quantity of pus was discharged. A drainage tube was inserted and the wound granulated up. On July 19th the patient felt well, and returned to work.

Fulham, S.W.

A CASE OF MEMBRANOUS TRACHEITIS AND LARYNGITIS WITHOUT THE PRESENCE OF DIPHTHERITIC BACILLI.

BY L. A. GRIMES, M.R.C.S. ENG., L.R.C.P. LOND.,
LATE HOUSE PHYSICIAN, ST. GEORGE'S HOSPITAL.

A BOY, aged four years and nine months, who was recovering from an attack of measles, was admitted into St. George's Hospital on May 18th, 1898, with marked stridor and great sucking in of the episternal notch and of the lower thorax during inspiration. On examination nothing abnormal was found beyond slight injection of the tonsils. The symptoms becoming rapidly worse and the child being in great distress tracheotomy was performed within half-an-hour of admission. Immediately the tube was inserted a large piece of membrane was coughed up. This membrane was of a greyish-yellow colour and very tough. Dr. Ewart's method of introducing creasoted oil (1 in 20) into the trachea was at once adopted. Five minims every 2 hours had the effect of softening the membrane, thus enabling the child to cough it up more easily and a fit of coughing was usually brought on immediately the oil reached the trachea. After 24 hours the dose was altered to 10 minims every 4 hours. In two days the membrane became quite soft and muco-purulent looking. Bacteriological examinations were made by Dr. Slater on the first day and on three other occasions, but though there were numerous bacilli that of diphtheria was always absent. The membrane became gradually less from day to day and the tube was finally removed on the twelfth day. The child made an uninterrupted recovery and was discharged within the month.

Albert-street, S.W.

A CLINICAL ASPECT OF THE ORIGIN OF TYPHO-MALARIA AND TYPHOID FEVER.

BY OWEN F. PAGET, M.B., B.C. CANTAB.

HAVING been long separated from any centre of learning, the modern view taken by bacteriologists of the biology of the typhoid bacillus is unknown to me, but I would venture to place before the profession some clinical observations made both by others and myself in Western Australia and the Sandwich Islands, together with the deductions arising therefrom.

1. In Western Australia single men and parties went out prospecting, usually taking with them only tinned meats, condensed water, and flour. They necessarily preferred virgin soil and camped as far removed from others as possible. In such a spot they might locate themselves two or three or more months and then develop typho-malaria or typhoid fever. Concisely put, a man starts from a probably typhoid-infected centre well in himself with food supplies almost certainly uninfected; he does not develop the disease until some time after leaving, which negatives the possibility of his carrying the disease with him, but develops the disease at a time when from the nature of his food, his use of patent pills, and the necessity of using local water-supplies—usually mere pools—the three important factors—namely, constipation, catarrh, and an infective bacillus—have been furnished for the development of the disease. 2. In the Sandwich Islands epidemics (not typically typhoidal in character) occur among the labour hands on the plantations characterised by high temperature, diarrhœa, and hæmorrhage from the bowel, and apparently arising through the labourers drinking water from the streams. 3. True typhoid fever occurs both in Western Australia and the Sandwich Islands. 4. In Western Australia cases were far less typical at the commencement than at the close of the typhoid fever season.

The above-mentioned observations have led me to form the following hypothesis: (1) that the typhoid bacillus exists in virgin soil; (2) that the typhoid bacillus requires educating—i.e., transference through a series of hosts before it produces typical typhoid fever; and (3) that so-called typho-malaria is due to an uneducated bacillus. These three hypotheses appear to me to be reasonable, firstly, from their analogy to the biology of the diphtheria bacillus; and secondly, from the excellent results obtained in both diseases by the use of olive oil.

Melton-Mowbray.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

LONDON HOSPITAL.

TWO CASES OF OVARIOTOMY IN WHICH THE BOWEL WAS TORN; RECOVERY.

(Under the care of Dr. LEWERS.)

PROBABLY the most dangerous complication of the operation of ovariotomy is wounding of the bowel and this most commonly occurs in the separation of adhesions. The presence of an adhesion to a piece of bowel is in itself sometimes sufficient to weaken the bowel wall at the point of attachment, for it tends to limit the action of the muscular fibres in the wall at that spot, and thus may lead to their partial degeneration; as a consequence the wall of the intestine is especially liable to tear when adhesions are being broken through. Nothing but the prompt and skilful suturing of the torn bowel can save the patient's life and those who operate in these cases must be prepared for some of the most difficult complications in abdominal surgery. The uneventful course which such cases may run if the injury is immediately recognised and remedied is well exemplified in the two cases recorded below.

CASE 1.—A married woman, aged twenty-two years, was admitted into the London Hospital under the care of Dr. Lewers on Dec. 18th, 1897, complaining of pain in the right side. She had been married ten months, and four weeks before admission she had a severe pain on the right side of the abdomen which "doubled her up." She at once consulted a medical practitioner who told her to go to bed and ordered poultices to be applied to the abdomen and at first the pain was relieved. Three days later she miscarried, having been six months pregnant. She lost a good deal at the time and continued losing for nearly three weeks after the miscarriage. The pain was still very severe and there was occasional vomiting after food. At the end of three weeks she was able to get up, but the pain returned and she was obliged to take to her bed again, where she remained until she went to the hospital. She has had no shivering fits, but at times she has felt very hot. She had always been delicate and has had scarlet fever and influenza. The catamenia had never been

very regular. During her illness the bowels had been very constipated and two days before admission she had an enema. There had been some pain on micturition. In the abdomen there was a swelling rising out of the pelvis; it lay with its long diameter vertically, to the right of the middle line; it measured about 4 in. by 2½ in. The swelling seemed to have a certain amount of mobility and was only slightly tender on palpation. The sound passed seven inches, apparently into the swelling. Bimanually the uterus was fairly moveable and of about the normal size. On admission the temperature was 100·8° F., but by the morning of the second day it had fallen to normal. The patient remained in bed and the tenderness slowly diminished, and the tumour became more defined and more moveable; it was noticeable that the swelling appeared to be close under the anterior abdominal wall. On Jan. 3rd, 1898, there was a little more tenderness over the tumour, but the temperature was normal. On Jan. 15th Dr. Lewers examined the patient under an anæsthetic and found that the swelling could be pushed over to the right but not to the left. The uterus was not enlarged and was quite separate from the tumour; the sound entered 3 in. On Feb. 5th the swelling appeared to be slightly smaller, but otherwise the signs were unchanged. On the 10th the patient was put under the influence of the A. C. E. mixture and a vertical incision 3 in. long was made between the umbilicus and the pubes. The tumour was found to consist of the right ovary which had become converted into a mass as large as a hen's egg, containing pus, some of which escaped on manipulation. The tumour was adherent to the anterior abdominal wall, to a portion of the small intestine and to the vermiform appendix. The adhesions were separated, some being previously ligatured. In freeing some of the adhesions to the bowel a small tear was made through the wall of the intestine; this was closed with fine silk and the peritoneal coat was drawn together over it by Lembert's sutures. Another doubtful opening was similarly covered. The broad ligament and the Fallopian tube were ligatured with stout silk and the ovary and tube were removed. The wound was closed, an iodoform gauze drain being inserted at each end of it, and a dressing was applied. The patient passed a fairly good night after a hypodermic injection of morphine. She vomited several times and complained of much abdominal pain and of thirst. The abdomen was not tender or rigid. The dressings were changed, a little sanious discharge being present. The temperature was normal. The patient steadily improved, the pain disappeared, and the gauze drains were removed on the 16th. On the 24th the stitches were taken out, the wound having completely healed. She left the hospital wearing an abdominal belt on March 15th.

CASE 2.—A married woman, twenty-eight years of age, was admitted into the London Hospital on Feb. 8th, 1898, complaining of dysmenorrhœa and pain on coitus. Her health had on the whole been good. She had small-pox when she was twelve years old. She had been married for five years, but she had not had any children or any miscarriages. The catamenia were regular, but she had usually had a good deal of pain at the commencement of each period. For this she was treated in June, 1897, by a medical man; the cervix was dilated and "electrical treatment" was employed. This was followed by pelvic inflammation and she was laid up for five weeks. On examination a swelling could be felt in the left iliac region, rising about 3 in. above the pubes; it extended as far as, but not beyond, the middle line and it appeared to rise out of the pelvis. The uterus, which was distinct from the tumour, seemed to be very nearly fixed and the sound entered 3 in. The temperature on admission was 100° F., but soon fell to normal. By Feb. 24th the patient's condition had hardly changed; the temperature varied much, rising to 100·5° in the evening and falling to 97·5° in the morning; her general health seemed good. The patient having been anæsthetised, Dr. Lewers made a median incision, 5 in. in length, between the umbilicus and the pubes. The tumour was seen lying in the left iliac region and was of about the size of a fœtal head. It was extensively adherent to the pelvic structures and to the bowel. The mass was gradually separated from surrounding parts, the adhesions being seized with forceps, cut through and ligatured when necessary. Just as the tumour was completely freed and as it was being removed it ruptured and some pus escaped. This was quickly taken up with pads of iodoform gauze and it was then found that the sigmoid flexure had been torn where it had been adherent to the mass. The opening was about $\frac{1}{10}$ in. in diameter. Five silk (Lembert) sutures were inserted. The tumour proved to be a suppurating ovarian cyst; the left Fallopian tube was dilated to the size of the thumb, the walls were thickened and the fimbriated extremity could not be found; the liquid in the tube was blood-stained, but was not pus. The right ovary was slightly enlarged and adherent; this with the right tube was ligatured and removed and the tube was then seen to be dilated to the size of the middle finger and the walls thickened. The ends of two pieces of iodoform gauze were left in the peritoneal cavity, one at the place whence the tumour was enucleated and the other in Douglas's pouch. Five deep and five superficial sutures were inserted in the abdominal wound. Some vomiting occurred after the operation, but the patient slept fairly well, and on the next day the abdominal walls were rigid and only slightly tender, though she complained of much pain. The dressing was changed; there had been a good deal of discharge. The temperature was 98°. During the following night there was much sickness and she had less than an hour's sleep, but the wound looked well. There was slight tenderness at the lower part of the abdomen. By Feb. 27th the vomiting had ceased and milk was taken well. On March 1st the gauze drains were removed; the abdomen was quite free from rigidity. The temperature was 100° and a small piece of gauze was reinserted. The gauze was removed on the 2nd, and though for some days there was much exudation the wound finally closed by the 11th and the stitches were removed on the 15th. She was allowed to get up on the 21st and on the 26th she left the hospital perfectly well.

Remarks by Dr. LEWERS.—A point of some importance in both these cases is that during the greater part of the operation the Trendelenburg position was employed. I think that had it not been for the good view of the parts so obtained the laceration of the intestine might very probably have escaped notice, in the second case more particularly. In Case 1 it will be seen that when the patient was first examined the sound passed 7 in., although the uterus was felt bimanually to be only of about the normal size, and it passed up apparently into the tumour to the right of the umbilicus. On another occasion the sound could only be passed 3 in. At first sight the most probable explanation of such a discrepancy would be that the sound had perforated the uterus. But in the case in question the uterus was carefully inspected at the operation to see if there was any evidence of a perforation having been made and no sign of any such thing was discovered. My belief is therefore that in this case on the first occasion the sound passed along the right Fallopian tube. It is not often that an opportunity of getting fairly conclusive evidence of such an occurrence is afforded and no doubt in many cases where it has been supposed to have happened the explanation is that the sound has perforated the uterus. In the present instance the examination of the uterus during the operation showed conclusively that no such perforation had occurred, while, on the other hand, the right Fallopian tube could be traced from the uterus up to the situation of the tumour, the highest point of which was to the right of the umbilicus. The purely abdominal position of an ovarian tumour of only the size of a hen's egg is no doubt accounted for by it having become inflamed and adherent to the abdominal wall when it had been carried up to its position in the abdomen by the pregnant uterus. The patient had miscarried at the sixth month some three weeks before her admission to the hospital.

ANCOATS HOSPITAL, MANCHESTER.

A CASE OF RICHTER'S HERNIA; SLOUGHING OF BOWEL; SUTURE; RECOVERY.

(Under the care of Mr. STANMORE BISHOP.)

RICHTER'S hernia or partial enterocele was for a long time confused with Littré's hernia, or a hernia of a Meckel's diverticulum. The symptoms which may accompany a partial enterocele may vary within very wide limits. In some cases they are very severe, the vomiting is incessant and a fatal result follows within a short space of time; while in others no signs of interference with the lumen of the bowel are present, and there may be no suspicion of anything wrong until perforation occurs. These differences are probably to be explained by the varying extent of circumference of the bowel included within the constricting ring.

In the more serious cases nearly the whole of the circumference of the piece of bowel is involved, and as at the same time the gut is sharply bent, the symptoms are severe; but if only a small proportion of the intestinal wall is nipped, there is very little interference with the lumen and the passage onwards of the intestinal contents, and as a result no vomiting may occur.

A man, aged forty-seven years, was admitted into Ancoats Hospital on Nov. 15th, 1897, for swelling of the scrotum. He had had no previous illness and had no idea of the cause of his present condition. He believed that he must have had a "strain," but remembered no special occasion. Seven years ago he first felt pain in the abdomen and recollected the occurrence of some swelling in the right inguinal region, and for this he wore a truss for three or four years. Since that time he had worn nothing and although having vague pains from time to time he had never been obliged to leave his work. On Nov. 8th, 1897, he had sudden pain, accompanied by great enlargement of the right scrotum. On the 15th, having tried fomentations and poultices in the meantime, he sent for a surgeon, who attempted taxis, and failing sent him to the hospital. He said that the bowels acted during this week but not every day. There had been nausea but no vomiting. When admitted his scrotum was of the size of a Rugby football. Taxis was again tried by Dr. Hartley, the house surgeon, who succeeded in reducing the swelling considerably but not completely. The sensation on taxis was that of reduction of a hernia, the last returned portion passing in with a "slip." On the day of admission the right side of the scrotum was tense, dark in colour, and of the size of a cocoanut. The patient was apathetic; this mental condition increased until after the operation. On the next day (Nov. 16th) a large black slough was found at the lower extremity of the scrotum extending upwards posteriorly. This was offensive in smell and crackled under pressure. On the 17th it gave way and thin fæces escaped. The scrotum was covered by a boric poultice, which was frequently renewed, and by the 25th the necrosed tissue was all removed. Fæces meanwhile escaped freely through the gap and the patient became more and more apathetic. The temperature during this time was very irregular, varying from normal to 100° F.

On Nov. 26th an incision was made through healthy tissues parallel to and 1 in. inside the right anterior superior spine. It opened into a cavity at the base of the scrotum and one continuous with the interior of the right side of the scrotum; both of these cavites contained fæces and were lined by granulation tissue. There was no trace of cord or testis unless these were represented by some strands of whitish fibrous tissue. Above and in the situation of the internal inguinal ring was a gaping opening in the extremity of a loop of intestine with projecting folds of mucous membrane. This opening represented the end of the descending limb, which lay vertically, and from it fæces could be seen escaping. Below and internal was a much smaller opening lying transversely to the former, the end of the distal limb. The two were continuous behind, but in front there was a gap 2 in. wide. An attempt was made to introduce a medium-sized Allingham's tube, but owing to the angle at which the two openings lay this was impossible without freeing the gut from its attachments to the tissues around, which seemed inadvisable, so the two were united by silk mattress sutures which were so applied as to bring the serous surfaces together. A second continuous silk suture was superimposed. The cavity of the scrotum was then laid open and the granulation tissue was removed with a sharp spoon. The raw surfaces were united by sutures, a drainage-tube being left at the lower end. At the upper part of the incision a Mikulicz gauze drain was placed, the deeper part being in contact with the re-united intestine. The wound was dressed on the 28th and 30th. On Dec. 1st the stitches were removed. The temperature had never been above normal. There had been no escape of fæces. The scrotum looked healthy. The tube was shortened and the gauze was removed. The united bowel could just be seen at the deepest point of the upper wound, which was quickly closing up. Urine had been passed regularly without requiring the catheter. For the first two nights 20 minims of nepenthe were required. The patient was much brighter and more sensible. On the 2nd some fæcal matter escaped from the upper wound. This continued and on the 3rd the fæcal discharge was large in amount, but the fæces were thin and unformed. On the 4th the drainage-tube was removed from the scrotum. The fæcal discharge was much less; the scrotal wound had opened up somewhat, but there was no swelling. The bowels acted regularly *per anum* with pulvis glycyrrhizæ compositus. The cavity was well washed out with boric lotion and kept as clean and as dry as possible. On the 5th the fæcal discharge ceased and the opening in the bowel had evidently closed by the rapidly growing granulation tissue. The temperature remained uniformly below normal. From this date to the 12th there was no fæcal discharge and on the 12th the bowel was not visible. The inguinal wound was rapidly closing and the scrotum was much shrunken, the wound being almost healed. He took food well and was cheerful and lively. Both wounds were dressed with iodoform gauze. The bowels acted regularly. On Jan. 8th, 1898, he was discharged well. The inguinal and scrotal wounds had rapidly filled up and no further leakage took place, but he was kept in the hospital partly to ensure safety and partly in order to feed him up. His weight steadily increased from 7 st. 2 lb. on Dec. 18th when he was first weighed to 7 st. 10 lb. when he was discharged.

Remarks by Mr. STANMORE BISHOP.—Three points in this case seem noteworthy. It was evident from the condition found at the time of operation that this had been a Richter's hernia—that is, the strangulated portion of gut which had been compressed with sufficient force to cause sphacelation had not included the entire lumen but only the apex of the involved loop. This has always been considered the most fatal form of hernia, yielding the most pronounced symptoms. In this case, however, the whole process appears to have been gone through without to any great extent producing any constitutional disturbance, since it seems evident that the gut must have yielded on Nov. 8th—the day when he first complained of severe pain and of sudden great enlargement of the scrotum. Sufficient local plastic peritonitis was set up around to block off perfectly the peritoneal cavity and yet no absolute obstruction or even vomiting was produced. The second point is the curiously false impression given as to the result of taxis. The third is the apparently total destruction of the testis. No satisfactory history could be obtained which would show in what manner this came about. Nothing which in any way resembled a testis escaped from the scrotum after its sloughing, yet at the operation nothing but a large cavity lined with granulations and filled with fæces was to be seen

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A STATUE AND A BUST OF MORGAGNI.—The following account of Morgagni's statue at Forlì and his bust at Bologna is taken from an article in the *Gazzetta degli Ospedali* of July 14th. The medical school of St. Thomas's Hospital being desirous of obtaining a bust of Morgagni, an English committee, of which Mr. Shattock was chairman, entered into communication with the Italian medical men present at the Moscow Congress in August, 1897, and they on returning to Italy appointed a committee, with Dr. Soffiantini as its chairman, in order to take steps for the making of a bust on the model of the statue at Forlì. This statue stands in the principal court of the Palazzo degli Studi at Forlì, was unveiled on May 27th, 1875—that is, a hundred and four years after Morgagni's death at Padua—and was the work of Salvino Salvini, professor of sculpture at Bologna. It was erected at the instance of Camillo Versari, a fellow citizen of Morgagni and a professor at Bologna, who was at much trouble to procure old medals and portraits for the use of Salvini the sculptor, as well as of Pieroni the engraver who executed the medal bearing a likeness of Morgagni, which was presented to the company present at the unveiling of the statue. Professor Versari laid out 36,000 lire (£1440) on the statue and pedestal, which he presented to the town of Forlì; his library he bequeathed to the Medico-Chirurgical Society of Bologna. Whilst the statue was in progress Professor Cesare Taruffi, who filled the chair of Pathological Anatomy at Bologna, ordered from the sculptor a copy of the bust and placed it in the upper gallery of the University of Bologna. It was evidently expected that the statue would have been unveiled in 1873, because the medal already mentioned bears that date, but in that year cholera was prevalent in Italy and in 1874 there was a failure of the harvest. The bust was unveiled on Nov. 16th, 1874.

Reviews and Notices of Books.

A Century of Vaccination. By W. S. TEBB, M.A., M.D. Cantab., D.P.H. Swan Sonnenschein and Co.

THE name of the author of this volume is well known to anti-vaccinationists and the fact that he is the son of Mr. William Tebb, one of the fathers of the anti-vaccination crusade, will ensure the book an enthusiastic welcome amongst Mr. Tebb's followers. Moreover, the methods practised throughout its pages will commend themselves to the adherents of the cause. The volume as a whole contains nothing but the old, oft-exploded fallacies of the anti-vaccinationists, augmented to a certain extent by quotations from the dissentient report of the Royal Commission on Vaccination, which has been so destructively dealt with by Dr. J. C. McVail. All the old stock-in-trade is polished up a bit and exposed for sale in a well-got-up volume to which Dr. Tebb has seen fit to give the support of his degrees and qualifications. The author has obviously been at infinite pains to collect together every word which has been uttered against vaccination while carefully disregarding every argument which may be held to support it, and he has clearly worked himself into the mental attitude of a man so enamoured with the spots on the sun that he refuses to concern himself with the sun as a whole at all. It is apparent, however, that Dr. Tebb is fully alive to the existence of all which makes for the truth, but that some strong bias, hereditary or acquired, has led him to omit nearly the whole of it and to distort what he does not omit. To quote the Registrar-General when it suits the author's purpose and to omit all reference to him when it does not is certainly one method of controversy, but it is not one which we like to see a member of the medical profession adopting. And so too with all other authorities on the subject and with the medical profession as a whole. In one breath Dr. Tebb appeals to members of the profession and in another he infers that their opinions depend upon the state of their pockets. We cannot, however, occupy space in discussing in detail the manner in which Dr. Tebb demolishes, apparently to his own satisfaction, positions created in large part by his own imagination. We will, however, in justice to the author furnish one or two examples of his methods, and as affording on the whole the least threadbare material we select his remarks on glycerinated lymph, noting, however, by the way, that almost all other parts of the volume are equally open to criticism. As is now well known it is proposed to render calf lymph free from what have been termed extraneous organisms by *storing* it in dilute glycerine until it shall have been demonstrated by bacteriological processes to be free from such organisms. According, however, to Dr. Tebb, whom by the way we can hardly believe to be ignorant of Dr. Copeman's work in this direction, the method consists "in the addition of glycerine to the lymph." In thus representing affairs Dr. Tebb betrays no little ingenuity. The addition of glycerine to lymph as a diluent or vehicle just before the lymph is used has been a common practice for years, but as far as we are aware *storage* to render lymph pure and bacteriological examination to demonstrate its purity are of very recent date. But Dr. Tebb, assuming the new method to be identical with the old, although he has apparently read Sir Richard Thorne's report upon the new methods, states: "And hence we have abundant means of testing whether glycerinated lymph is so very innocuous after all." And now having paved the way with stones of his own construction he proceeds to relate certain instances where bad results are alleged to have followed the use of lymph to which what was alleged to have been glycerine had been added. Be it noted that all this relates to the simple addition of glycerine to lymph and not to the practice which it is proposed to adopt. Away goes the author to the past and to the Isle of Rügen in the Baltic, that happy resort of all anti-vaccinationists in the time of tribulation, where some 12 years ago certain cases of *impetigo contagiosa* occurred amongst children vaccinated with lymph to which glycerine had been added. In the Transactions of the Epidemiological Society (New Series), vol. v., Dr. Tebb has discovered an account of this outbreak from the pen of the late Sir George Buchanan, and in referring to the glycerine alleged to have been used on that occasion he states that "it has been suggested by the late Sir George Buchanan that this was the cause of the untoward occurrences." We have read the paper in question—our readers can easily obtain access to it themselves—and although we cannot discover that Sir George Buchanan definitely made the suggestion referred to by Dr. Tebb we have ascertained that Sir George Buchanan stated that the lymph was mixed with thymol and that there were indications that the lymph may have been potent for harm before the glycerine was added. Dr. Tebb has omitted to mention this point and curiously enough he has, doubtless quite inadvertently, overlooked Sir George Buchanan's opinion that "in the absence of dates and other information there is little to connect the prevalent disease with the operation that pretended to be vaccination." One more instance and we must leave Dr. Tebb's book to the judgment of those who read it side by side with the papers and works from which he has so freely quoted. It has been stated that glycerine added in certain proportions to calf lymph renders the mixture in course of time sterile *quâ* extraneous organisms. But Dr. Tebb has read that glycerine added in small quantities to certain culture media enhances the growth of the tubercle bacillus sown thereon. Here, then, cries Dr. Tebb in effect, is a new danger. Shall we not all die from tubercle? He must, however, know quite well that it is not proposed to use glycerine in such small proportions as are here in question, and he knows, too, that certain doses of arsenic or of mercury are good respectively for some skin diseases and some phases of syphilis. Does he, therefore, because too large doses of either of these drugs may produce a fatal result desist from employing them altogether? Surely, too, the author is cognisant of the fact that tubercle in selected calves is of extreme rarity, that tuberculin will detect even these cases, and that, furthermore, the calf can be killed and examined before the lymph which it yielded is distributed. Why does he not then, in common justice to his readers, place these facts before them?

A Text-book of Diseases of Women. By CHARLES B. PENROSE, M.D., Ph.D. Second edition. With Illustrations. London: Rebman Publishing Co. 1898. Demy 8vo. Pp. 515. Price 20*s*.

THE fact that this book has reached a second edition in a little less than one year shows that it has supplied a want. It gives a good representation of the views held by American gynæcologists at the present day and, as might be anticipated, some of the theories advanced and the practice advocated would not be unhesitatingly accepted by all gynæcologists in this country. It is, however, always as well to see what other people are doing and saying, and for this reason as well as for others the book will well repay perusal. In the chapter upon Injuries to the Perineum there is a good clinical account of the appearance presented by the perineum when the muscles of the pelvic floor are involved in the tear. The author does not apparently recommend the flap-splitting operation for repair of the perineum, but denudation of the parts and the removal of all cicatricial tissue before suturing. Emmet's operation for laceration of the

vaginal sulci is well described with illustrations. The section upon the Position of the Uterus contains a clear account of the varying conditions of the intra-abdominal pressure and the effect they have in favouring prolapse. In considering anteflexion of the uterus we note that the author still adheres to the view that the dysmenorrhœa so often associated with this condition is due to the accumulation of blood behind the obstruction in the cervical canal—a view almost, if not entirely, given up in this country. There is a good account of trachelorrhaphy and amputation of the cervix illustrated by some very instructive figures. The curious condition known as congenital erosion and split of the cervix has a chapter specially devoted to it, giving it an importance which we hardly think it deserves. The chapter on Cancer of the Cervix is full and instructive, although we might take exception to the statement that the chief predisposing cause is a laceration of the cervix, a statement still unproved by facts. The views of the author as to the treatment of fibromyomata of the uterus may be gathered from the sentence on page 241: "The great majority of fibroid tumours demand immediate operation." As to the truth of this we fancy there still exists a great difference of opinion. He prefers hysterectomy to salpingo-oöphorectomy and considers that at the present time the danger of the two operations is almost the same if those cases only be compared in which either operation could be performed. The great importance of acute and chronic salpingitis is duly pointed out and Dr. Penrose is cautious about recommending the various conservative operations upon the appendages which have lately come into vogue. In most cases of tubal disease he considers it safest to perform a bilateral extirpation. The chapter upon Tubal Gestation, although short, is clear, and stress is laid upon the fact that operative interference is called for in almost all cases. Under Ovarian Cysts a very helpful table is given of the chief differences between oöphoritic, paroöphoritic, and parovarian cysts. The importance of gonorrhœa in causing pelvic disease is held by the author to be so great that he has devoted a special chapter to its consideration. There is a good account of the technique of gynæcological operations in general and the special details of operations upon the uterus and its appendages. These chapters will be found to be very full and instructive. The author devotes some space to pointing out the great advantage of ligaturing the vessels in the broad ligament with as little of the surrounding tissue as possible rather than *en masse*. With this all surgeons will agree and there can be little doubt that the use of mass-ligatures will be more and more given up. The book is furnished with a fair index and, as we have said already, is well worth reading by those who desire to keep abreast of the views held by one of the most distinguished of American gynæcologists.

The Essentials of Histology, Descriptive and Practical, for the use of Students. By E. A. SCHÄFER, LL.D., F.R.S., Jodrell Professor of Physiology in University College, London. Illustrated by nearly 400 Figures. Fifth edition. London: Longmans, Green and Co. 1898. Pp. 359. Price 8*s*.

THE first edition of this useful compendium of histology was published in 1885 and in the thirteen years which have elapsed since that date to the present time Professor Schäfer has found occasion to add about 100 pages of letterpress and nearly 100 woodcuts which greatly increase the value of the work. The advances which have been made in the examination of the tissues and the interpretation of the appearances presented under the microscope are sufficiently evident on every page and are fully given. The very first drawing represents *in petto* the kind of progress which has been made. It is a drawing of a cell. The earlier woodcut shows only protoplasm with vacuoles and granules distributed through its substance—a nucleus with intranuclear network and nucleolus; the recent one, drawn on a much larger scale, shows the granular protoplasm of the cell as consisting of a network of spongioplasm containing hyaloplasm in its meshes. The distribution and variable size of the vacuoles are more clearly demonstrated, a double centrosome is shown, whilst the nuclear membrane, the intranuclear network, and the nucleolus complete the picture of the cell as far as is at present known. Several of the chapters—such, for example, as those on Cell Division, on the Structure of Muscle, on the Heart, and on the Central Nervous System—have been added or are greatly expanded, whilst every section seems to have undergone careful revision. The large personal experience of Professor Schäfer in the use of the microscope adds greatly to the value of the work by enabling him to select the good and reliable work of others and serves to render it the most authoritative work on histology in the English language.

Diseases of Women. By J. C. WEBSTER, B.A., M.D., F.R.C.P. Edin. With 241 Illustrations. Edinburgh and London: Young J. Pentland. 1898. Pp. 678. Crown 8vo. Price 14*s*.

THE author of this work might well have pleaded as an excuse for its appearance the success of his book on Ectopic Pregnancy, but he has not done so and indeed no such excuse is necessary. He has well fulfilled the aim he sets before himself in the preface of regarding his subject from a scientific basis, of considering the clinical features in their widest relationships, and of recommending due caution with regard to the adoption of therapeutic measures the usefulness of which is still undetermined. The book is one of considerable interest and gives a clear exposition of the subject of which it treats. It commences with a full description of the pelvic organs, the interest of the anatomical details being considerably enhanced by the addition of notes on development and in some places on comparative anatomy. The third chapter, one of the most suggestive in the book, as might be anticipated from the special work done by the author on this subject, contains a very clear account of the pelvic floor regarded from the point of view both of dissections and of frozen sections. In a chapter upon the Nervous System in Relation to Pelvic Diseases considerable stress is laid upon the importance of regarding many cases of chronic pain from the point of view of the general physician rather than from that of the specialist, a caution which cannot be too strongly insisted upon in any text-book of gynæcology. In considering the bacteriology of the pelvic tract the *rôle* of the gonococcus and of the tubercle bacillus in the production of pelvic diseases is fully discussed, and the reason why there exists a tendency at the present day to dispense with vaginal injections in connexion with labour is explained by the results of the researches upon the bactericidal action of the vaginal secretion. The section devoted to Operative Measures in General contains a full account of the various details necessary in the treatment of a patient before and after operation, and with its assistance the young practitioner should be enabled, as far as book-teaching can help him, to recognise any of the commoner complications likely to ensue, for instance, in the after treatment of a case of abdominal section. In connexion with pelvic hæmatocele the author recognises the possibility of its occurrence apart from ectopic gestation and calls attention to Gardner's two most interesting cases of pelvic hæmatocele associated the one with adenocarcinoma of the ovary and the other with tuberculous disease of the Fallopian tube. A good account is given of

tumours of the ovaries and the chapter is illustrated by numerous outline diagrams which will be useful in enabling the student to remember the commoner tumours likely to be mistaken for ovarian cysts. The illustrations on the whole are fair, but it seems a pity, if the author thought it really necessary to insert an illustration of an ordinary trocar, that he did not choose a more modern type of instrument than the one figured on page 400. Under Inversion of the Uterus we notice that the author describes in some detail amputation of the inverted fundus, a mode of treatment which we imagine hardly anyone would adopt at the present day in preference to vaginal extirpation, surely a much better and safer treatment for an irreducible case of inversion. As might be expected in a modern text-book the operative treatment of fibro-myomata of the uterus is fully described and a considerable amount of space is given to a consideration of the various operations which can be performed. We fail, however to find any clear indications given as to what are the conditions justifying operative interference and we are left uncertain as to whether the author would agree with those who maintain that all fibroid tumours causing symptoms should be operated upon, or whether he would agree with those who still think, in spite of all that has lately been maintained to the contrary, that the great majority of fibroid tumours can be perfectly well treated without operation. In describing and criticising the various views held as to the mechanism of prolapse of the uterus Dr. Webster calls attention to the important part played by the pelvic fascia, and points out that many of the writers upon this subject have entirely neglected to take into account the support given to the pelvic floor by the fascial layer. In the chapter upon Affections of the Urethra and Bladder a good and clear account is given of the various operations employed in the treatment of genito-urinary fistulæ. As an appendix to the book the author has contributed a very suggestive and interesting account of menstruation, including a consideration of the various views held as to its nature, causation, and relationships. From biological considerations he is lead to regard the menstrual function as a highly specialised means of balancing the anabolic and katabolic factors of tissue metabolism, a function which has become established in the higher mammals by a gradual process of evolution.

The book as a whole is one which we can confidently recommend to the student and the practitioner.

LIBRARY TABLE.

Autour d'une Épidémie: Bayonne 1837-1897. (Epidemic Cerebro-Spinal Meningitis in Bayonne from 1837 to 1897). By Dr. C. DELVAILLE. Paris: A. Maloine. 1898. Pp. 38. To trace the course of an infectious disease which prevailed throughout an extensive district sixty years ago is a task of magnitude, and Dr. Delvaille of Bayonne is to be complimented on the industry with which he has consulted epidemiological treatises, obtained information from parish records and local *maires*, and collected the reminiscences of aged people at various places. At the beginning of his essay he gives clinical histories of four cases of cerebro-spinal meningitis which occurred among civilians in Bayonne in February, March, and May, 1897, two of them being fatal. During February there were also eight cases, with four deaths, and in the end of December six cases with three deaths among the soldiers of the garrison. The historical inquiry shows that there were twenty-four deaths of soldiers from the disease in Bayonne in 1837, and that its prevalence among the civilian population caused serious alarm in many parts of the adjacent department of the Landes in 1837 and 1838.

Journal of the Scottish Meteorological Society, with Tables for the Years 1895 and 1896. Edinburgh and London: William Blackwood and Sons. Pp. 248. Price 15*s*.—The current number of this journal, which is an annual publication, contains four original papers and about 170 pages of tabular matter. The observations for 1895 show that during the memorable frost in the early part of that year the temperature repeatedly fell below zero Fahrenheit at many stations in Scotland, the lowest temperature observed being −17·0° F. at Braemar, in Aberdeenshire, on Feb. 11th. "This exceedingly low temperature is further remarkable as being absolutely the lowest temperature hitherto observed in any month or anywhere in the British Islands with a properly protected thermometer." The reports made by the council to the general meetings of the society contain copious references to the value of the work done at the Ben Nevis Observatories, the expenses of which have unfortunately come to be in excess of the available funds. The observations made there from 1888 to 1896 are sufficient to fill two large quarto printed volumes.

Lectures on Asepsis in Surgery: Delivered in Arabic at the Cairo Medical School. By H. MILTON, M.R.C.S. Eng., L.S.A. Cairo: Al-Muktataf Printing Office. 1897. Pp. 113. Price 20 piastres (4*s*.).—One of the many benefits conferred on Egypt by the British occupation is the sound medical training provided for such native practitioners as may be willing to learn European methods. Mr. Milton's course of five lectures on asepsis, delivered in the vernacular and printed in English and Arabic arranged in parallel columns, is both a literary curiosity in consequence of its bilingual character and an excellent practical manual well adapted for students and nurses. The principal subjects treated of are as follows:—Elementary Bacteriology; Sterilization of Instruments, Dressings, Hands of Operator and his Assistants, and Patient's Skin; Application of Antiseptics to Operation Wounds; Changing of Dressings (in Cairo two days is the longest safe limit); Washing Out the Peritoneal Cavity; Drainage; Treatment of Compound Fractures. The lines of the English and Arabic printed columns are parallel to the back of the book.

Posological Tables of the British Pharmacopœia for 1898.—This useful little book compares the doses and strengths of official substances as given in the Pharmacopœia for 1898 with those given in that of 1885. It is published by Messrs. Jewsbury and Brown of Manchester, who will forward a copy to any medical man if he will apply to them for one.

JOURNALS.

Journal of the Sanitary Institute. Vol. XIX. Part II. July, 1898. London: Edward Stanford. Price 2*s*. 6*d*.—The "Purification of Water for Barrack Prisons and other Institutions" is the title of Lieutenant-Colonel Lane Notter's (R.A.M.C.) paper which was read at the sessional meeting in February. The question is approached with a view rather to the conditions which obtain in India and other places abroad than to those which prevail in this country. The proposal to render water sterile by the addition of bromine or calcium hypochlorite, though apparently effective, is hardly one which will commend itself to people accustomed to English methods. Still, under certain circumstances abroad, it might find its uses. Dr. C. Childs's paper on Water-borne Enteric Fever gave rise to a discussion at the Institute which was raised to a good level by a letter to the chairman from Dr. Sims Woodhead, who drew attention to the great importance of ensuring the purity of the soil through which water-mains and pipes are carried. The volume contains other papers and notices of interest.

THE LANCET.

LONDON: SATURDAY, AUGUST 13, 1898.

AFTER a chequered career, full of startling episodes and reversals, the Vaccination Bill becomes virtually the Vaccination Act. In Parliament the hottest of the contest centred round the conscientious objector. First of all the Bill contained no conscience clause; then in the second reading debate Mr. CHAPLIN for the Government declared that he would resist to the death any such clause. In the Grand Committee he successfully maintained this attitude for a time and defeated by a very narrow majority Sir WALTER FOSTER'S amendment to the contrary. Later, however, Sir WILLIAM PRIESTLEY defeated Mr. CHAPLIN in so far as to obtain the acceptance of conscientious objection at four years of age as a substitute for a second penalty. In the House of Commons the Government once more, through the mouth of Mr. CHAPLIN, announced that it would never consent to recognise the conscientious objector; then, through the mouth of Mr. BALFOUR, it did consent and itself introduced and carried a clause. Next, on the third reading, it adhered to its new view and refused to recommit the Bill for the purpose of deletion of the Clause. "In another place," however, the Lords spiritual and temporal overcame the Government after a very close fight and expunged the added clause. In the Commons it was once more inserted and on the return of the Bill to the Lords they agreed by a majority of 55 to 45 to let the Government and the Commons have their way.

It is a curious point that some of those who, like Lord SALISBURY, fought most strenuously on behalf of the conscientious objector indicated at the same time that they entertained serious doubts as to his very existence, conscience in their opinion having little or nothing to do with the matter. Even a misnomer, however, is more convenient than no name at all, and to have given him his rightful title would have made his defence more difficult to those who felt it their political duty to defend him. While, therefore, they grumbled over the term "conscientious objector" they had not the courage to substitute the word "faddist" or to define the conscience clause as a clause for the relief of cranks. Not that we ourselves have objected to the recognition of the existence of anti-vaccination cranks. On the contrary, we have held that it is the duty of Parliament to look plain facts in the face, one of these facts being the increase in many parts of the country of the numbers of these cranks and of their evil influence on the general community. In our view, indeed, the "conscience clause" is to be regarded as a kind of asylum for the reception of such persons and for the prevention, so far as may be, of the injury which they are otherwise capable of doing to the public. Their posings as village HAMPDENS, their dearly loved imprisonments, and presentations, their processions, and brass bands, and baitings of auctioneers engaged in the disposal of impounded goods must now in great measure be given up. They themselves testify how loth they are to part with these delights and how anxious to retain some fragment of them. Regarding the passing of the conscience clause the official organ of the Anti-Vaccination League eagerly urges that "it by no means ends our struggle. It still remains true that a man must waste a day's work and expose himself to trouble and probably to insult at the hands of some ignorant upstart on the bench if he wishes to keep his children's blood unpolluted," and it vows that "there shall no court adjudicate on our conscience in respect to our children." If this means anything it means that there will now be refusal alike to procure the vaccination of the child and to take the steps provided for avoiding penalties for non-vaccination. In that event the law will take its course and refusal to pay a penalty will be followed by seizure of goods or imprisonment. But is the League quite sure in its own mind that seizure of goods and imprisonment will have the same desired results under the new system as under the old? Will it be possible to rouse the same prejudice and passion over JOHN SMITH'S refusal to go before a court in order to state his objections to vaccination as could be roused when JOHN was able to allege that he was suffering martyrdom in order to "keep his children's blood unpolluted"? We hardly think so; but it will certainly be interesting to watch during the five years to which the operations of the new Act are limited the struggles of the League to keep alive its hitherto comparatively easily maintained agitation.

For us the main feature of the later proceedings of Parliament regarding the Bill is the important statement by Lord LISTER, confirmed for the Government by Lord HARRIS, that we may expect a Revaccination Bill to be introduced next session. For the public weal this is, indeed, good news and in our estimation it should go far to allay the anxiety which the medical profession naturally feels as to the likely recrudescence of small-pox in this country as a result of neglected infantile vaccination. That Bill will be awaited with the greatest interest and will be heartily welcomed in so far as it makes a serious attempt to establish a national system of revaccination. It may be hoped that the Bill will not concern itself with revaccination alone, but will contain some of the more important of the other provisions which have been urged on the Government by the medical profession, but which have not found a place in the present measure.

One of the most satisfactory side-results of the introduction and discussion of the Government Bill in the session which is just closing is the elicitation of a huge body of usually silent public opinion regarding the value and essential importance of vaccination. In Parliament Mr. CHAPLIN complained that it was only anti-vaccination that gave voice to itself until his proposal for a conscience clause roused the other side into speech. So it has been in the country in connexion with the merits of vaccination itself. So long as the public believed that vaccination was in no danger they treated with sovereign contempt the orations and newspaper letters of the anti-vaccination crusaders, but when once they came to suppose that there was some sort of danger that under Government auspices vaccination might fall

into desuetude they spoke out in quite an unmistakable fashion—in a fashion, indeed, which has no doubt had a very considerable share in inducing the Government to promise the legislation for revaccination which the profession has demanded so earnestly and up till now so unavailingly. If the introduction of the conscience clause has done nothing else it has done immense good not only in opening the way to revaccination, but in influencing the Government to step forward into the excellent path of duty thus opened before them. May their progress therein be unfaltering and persevering until the desired goal be attained.

THE Americans have been most successful in their war with Spain so far as any actual fighting has had to be done. The enterprise, audacity, and skill displayed by their naval service have been unmistakeable and attended with remarkably successful results, even if it has to be admitted that the Spaniards at sea have always been overmatched and their naval commanders have exhibited a lamentable want of those strategical and tactical qualities which certainly might have made their fleet most embarrassing, if not formidable and dangerous, to their American enemy. Great pluck and courage in facing defeat and death they have, however, undoubtedly displayed. The American troops have also shown, as might have been anticipated, of what splendid fighting material they are composed. But, despite the brilliant results at Cavite and Santiago and the dramatic successes hitherto attained by the American forces, there will be great rejoicing in the United States when peace with Spain has become absolutely assured and when the existing state of anxious tension is relieved in regard to the deplorable condition of General SHAFTER'S force in Cuba and the numerous outbreaks of typhoid fever elsewhere in the camps of the United States army.

We do not take any special credit for having from the very first dwelt upon the probability that the real enemies—more deadly than the soldiers of Spain—would turn out to be malaria, typhoid fever, yellow fever, and dysentery, for this was generally recognised. It has been the experience of most expeditions undertaken under similar conditions, even if the lamentable medical history of the Spanish losses of recent years in Cuba had not told the same story and clearly indicated the same moral. In spite of the firm belief that war was bound to occur with Spain on account of Cuba, which must have been long present in the minds of the Government and people of the United States, it found them quite unprepared when it did come—at least, as far as the land forces were concerned. Even if Spain has accepted the proffered terms of peace without any reservations the political and military difficulties which still remain to be settled are very great; but the serious health condition of the American army is now *the* emergent and pressing consideration. The troops in Cuba—at Santiago and in its vicinity—are, according to the official declaration of their generals and officers, in a deplorable condition. General SHAFTER'S report of July 6th states that the sick on that day numbered 3681, including 2638 fever cases, of which 421 were fresh cases. The number of men who returned to duty was 477. The deaths numbered seven, none of them being due to yellow fever, but on the 7th these numbered eleven, of which five were due to yellow fever. The American troops disembarked in Cuba were fine fighting material and full of enthusiasm, but they had to begin their campaign at the commencement of the unhealthy season; they had heavy marches and hard fighting in an excessively hot, enervating, and malarious climate; they were badly equipped; they had no change of clothing and no shelter during the campaign; the weather was very wet and stormy; they were rationed on bread, meat, and coffee, the provisions were probably mostly tinned or preserved, and what fresh meat was procurable was necessarily tough and innutritious. The men were greatly fatigued and exhausted by their work and hardships in the field and their want of rest and sleep. The outcome of all this was, as might have been confidently expected, harvested as soon as the excitement was over and nervous exhaustion began to follow. At least 75 per cent., it is alleged, contracted malarial fever, from which recovery is very slow. It is easy to understand that the troops were consequently in a state to contract any disease but in no condition to withstand any such attacks, especially those of yellow fever or dysentery. Very little is said of the field hospital service accompanying the troops or of their medical supplies, but from the nature of an expedition of this kind, with rapid marches in a difficult country, it is scarcely likely that these supplies were provided on a scale adequate to the requirements of the force or that, if such were the case, they could have accompanied it where the transport of ammunition, commissariat and other stores must have been most difficult. What now remains to be done is to remove as soon as possible the present force, exhausted by the effects of their campaign and enervated by malaria, from Cuba to well-selected positions in America and to replace it by fresh troops from the United States. The shipping transport to be employed for this purpose should be capable of affording ample accommodation and be well provided in every respect with everything needful for the physically enfeebled and fever-stricken soldiers, together with ample supplies of quinine and good fluid nourishment of all kinds suitable to men under such circumstances. The troops sent to replace those removed should be composed of strong, healthy, and matured men suitably equipped for the climate and service; everything should be prepared beforehand for their reception at Santiago and along the marching route, with rest-camps at intervals so that they can reach their destination leisurely and without undue fatigue.

The lessons to be learned from the breakdown of General SHAFTER'S force briefly comprise, in other words, the duties of a country to its army and of the medical service to the soldiers under their charge. Under any circumstances an expedition to such a climate—the soldiers being young and unacclimatised men unaccustomed to campaigning and newly arrived in a hot, malarious and insanitary country—must be prepared to encounter serious risks to health, but these may be in a large degree discounted by forethought in the provision and settling of all the requisite hygienic details

beforehand. Time is here an important element of course. There is no royal road to the end in view. England, France, and other countries have had to learn by bitter experience that every sanitary detail has to be carefully thought out and, as far as practicable, provided for in view of escaping disastrous consequences. The nature of the climate and its diseases, the choice of the best season for military operations, the selection of the force, the food, the clothing, the best times for marches, and many other matters of military hygiene have obviously to be all most carefully considered. On all these points it falls within the province of the medical service to furnish their recommendations and suggestions for the information of the War Office and military officials, and we can only assume that this was done. General SHAFTER, it is alleged, blames the medical department and declares that it did not make adequate provision for the needs of the army and refuses to accept any responsibility for shortcomings attributable to the Surgeon-General and his service. The Surgeon-General, on the other hand, according to the special correspondent of the *Times*, has issued a printed statement in defence of his department and blames the service in control of the transport. The matter, which is a very serious one, calls for further investigation, which it will most certainly receive. Meanwhile the people of the United States are an eminently energetic, practical people, and we may be quite sure that they will recognise and do their very best to remedy any difficulties or defects which can be overcome. Everything points to the Americans having in future to make a large increase in their fleet and army of regulars and their medical services.

THE output of new synthetic remedies is becoming colossal—there is no other word for it—and so intimate a knowledge is the chemist gaining of the structure of compounds that it appears to be only necessary to indicate to him the kind of compound wanted when he immediately produces it in the form probably of a crystalline powder. Indeed, it is the rapid realisation of stereo-chemistry or structural chemistry which is largely responsible for the great number of complex compounds which the synthetic chemist is continually bringing before the notice of the profession in the form of new remedies. It is pretty safe to say that in general they are coal-tar derivatives, offspring of the benzene nucleus, belonging to the aromatic series or closed chain compounds. We have little to urge against the marvellous ingenuity of the modern chemist in thus elaborating an almost endless series of compounds which with few exceptions, be it remarked, are invariably tendered as belonging to one of three classes of drugs—namely, antiseptics, antipyretics, and analgesics. Nor would we belittle the importance of these synthetic processes considered as triumphs of our knowledge of architectural chemistry for we cannot help bearing in mind the great number of valuable additions to pharmacology which have thus been made. We need not give examples; they occur again and again in the new Pharmacopœia (1898).

One point, however, which to our mind is of the utmost importance in relation to the progress of therapeutics deserves at this juncture to be brought into notice. It is this. The rapid and apparently endless production of new synthetic compounds is such as to leave little or no time to determine their real pharmacology. No sooner is a substance discovered than it is put upon the market as a new remedy, an analgesic, antipyretic or hypnotic; it is soon superseded by another which is claimed to have a more reliable and more satisfactory effect. Well may the practitioner stand aghast, for no time is left to study the relation of the structure of the new compounds in regard to their precise therapeutic effects. And thus many of the so-called new remedies are administered blindly, sometimes with good effects, sometimes with an indifferent action and sometimes with bad sequelæ. Now from the point of view of the chemistry of compounds and more particularly their structure in relation to their action on the system this is distinctly retrograde. In other words, this multiplicity of organic compounds bewilders the physician, and, what is worse, tends to take him back to pure empiricism. There can be little doubt that a knowledge of the physical properties of the chemical composition and structure of substances will eventually enable us, if we pursue the study intelligently, to predict the nature and extent of the value of a substance in treatment—i.e., as a drug. We possess already sure and certain evidence that this may be so. The action of certain drugs, it is well known, may be so modified by the introduction of a new molecule as not only to lose their original properties but actually to become pharmacologically active in the reverse direction. It is upon this basis that there is promise of much progress being made in pharmacology and in treatment by drugs. The subject has recently been touched upon in a masterly style by Mr. CHARLES SYMES, Ph.D., on the occasion of his presidential address at the opening of the British Pharmaceutical Conference in Belfast on the 9th inst. As he pointed out—and there is an excellent moral connected with the observation—most of the synthetic remedies are produced in Germany, where the manufacture has become an extensive chemical industry, for the simplest of all reasons, that in that country there are less restrictions on experimenting with animals than in this country; the chemist and physiologist work together, the one altering the molecules and molecular arrangement in the chemical substance, and the other testing most carefully the effects obtained thereby. In another part of his address, for an advance copy of which we are indebted to the courtesy of the editor of the *Pharmaceutical Journal*, he adds that the chemist is now the architect and builder, using certain atoms and molecules to build up chemical structures to meet the wants of the medical profession in the treatment of disease. That may be so, but is not the tendency thereby induced more on the side of empirical than of rational treatment? Some proof of this surely appears in a later and, we think, very trenchant remark, in which, after giving a list of many of the new synthetic remedies together with their formulæ and scientific names (which are generally very long, as, for example, benzoylmethyl-tetramethyl-γ-oxypiperidine-carbonic-methylester, this being the expressive name of eucaine, a comparatively new anæsthetic), he says of the fifty substances enumerated: "It will be noted that a large percentage possess antiseptic, antipyretic and analgesic properties; *so that their rapid growth would seem to be due more to commercial enterprise*

than to meeting a real want in medical practice." The italics are ours.

We appeal, therefore, for further research and more opportunities for such research, otherwise pharmacology will remain empirical instead of being based, as it should be, on the structure and constitution of bodies. If structure determines the action of a remedy, surely the only scientific course to pursue is to ascertain what are the exact changes which a modification in structure will produce. Then with the knowledge and skill of the chemist we may vary at will our remedy and so attain results in accordance with the necessities of the case. But with such an innumerable host of remedies announced as newly discovered substances day by day such a study is well-nigh impossible, at least if it is to keep pace with the number of compounds at present elaborated in this multiplex fashion.

Annotations.

"Ne quid nimis."

THE REPORT OF THE BOMBAY PLAGUE RESEARCH COMMITTEE.

WE have received a copy of the report of the Bombay Plague Research Committee which has recently been issued. Strictly speaking we ought to say that the report is only that of certain members of the committee—i.e., the reports of Surgeon-Major Lyons and of Surgeon-Captain L. F. Childe are given in full; of Mr. E. H. Hankin's report a summary only is given; and Dr. W. M. Haffkine has not yet arranged the material which he has collected in the form of a report. Surgeon-Major Lyons gives a very full account of the course and symptoms of an ordinary case of plague and in addition of the two "erratic" forms where, although most of the general features of acute plague were present, there was neither enlargement of the lymphatic glands during life nor was there found anything in these glands after death but slight enlargement and congestion. In one of these forms—septicæmic plague—the microbe grows in the blood; in the other it grows in the lungs, giving rise to primary plague pneumonia. The septicæmic form was very fatal and began with severe rigors; it was also characterised by severe nervous prostration and marked cerebral symptoms. The pneumonic form somewhat resembled an ordinary severe pneumonia except in three important points — firstly, the rusty sputum of ordinary pneumonia was absent; secondly, the pulse-rate in plague pneumonia became very frequent in direct ratio to the rate of the respirations; and thirdly, the physical signs were those of broncho-pneumonia rather than of lobar pneumonia. Plague in the pneumonic form is exceedingly difficult to diagnose in an early stage, and the importance of an early diagnosis is all the more to be insisted upon since the sputa from the first contain plague bacilli. In the Bombay epidemic no cases of glandular fever were met with. This disease has been considered as being plague and is characterised by the appearance of buboes with little or no constitutional disturbance. In Calcutta a number of cases have occurred, but up to the date of the report (November, 1897) no cases of true plague had occurred in that city. The treatment by antitoxin has not up to the present met with much success. Surgeon-Captain Childe deals with the macroscopic and microscopic pathology of plague together with the mode of exit and entrance of the plague bacillus from and into the body. It leaves the body by means of hæmorrhages or secretions which may contain blood—e.g., the urine. In the pneumonic type the bacillus is always present in the sputum. With regard to the mode of entry the bacillus generally finds admission through some slight lesion of the skin, it produces no local reaction at the seat of inoculation, and a bubo forms at the lymphatic gland nearest to the seat of inoculation in the direction of the lymph-stream. With regard to infection by food no evidence was found post mortem that the bacillus had entered by the stomach or intestines, but cases of cervical bubo might have resulted from infection through abrasions on the lips, tongue, or tonsils. The following is Surgeon-Captain Childe's account of a marked case of plague pneumonia:—

"The patient, a medical man, was in his usual health on Jan. 2nd and had a sudden rigor in the morning and felt fever coming on. During the day a bad headache developed, he felt nausea and vomited several times, and he had pains and a tired feeling in his limbs; his tongue remained clean and moist and his skin was slightly moist. At 2 P.M., temperature 103·4°, pulse 116, respiration 25, and there were but slight variations during the day. On Jan. 3rd had passed a bad night and felt worse, and all the symptoms persisted except the aching of the limbs, and he felt very ill. The temperature remained between 103·5° and 104·5°, pulse about 110, and respirations about 23 throughout the day. During the afternoon he felt some pain at the lower part of the left axilla just under the anterior fold, but there was no glandular enlargement or pain in the glands anywhere. On Jan. 4th had passed a bad night and felt very ill, temperature 104·6°, pulse 113, respiration 25, tongue still moist with a little fur behind, and no sordes about the lips or teeth; the other symptoms as before. During the night he began to cough and brought up some watery sero-mucous fluid, slightly blood-tinged, and the pain remained in the same place, only more diffused now, being felt over an area of a square inch. At this part some moist sounds could be heard like those of early pneumonia and they could also be heard just below the left clavicle; the rest of the lungs and other organs appeared to be normal, as did the lymphatic glands. Patient considered that he had pneumonia, but the symptoms were not like ordinary pneumonia.

"For the onset was different, the condition of the tongue and mouth different, there was no dyspnœa or pneumonic disproportion of pulse and respiration, and the sputum was not at all like rusty sputum, for it was loose and free, coming up with the slightest cough, it was watery, looking more like serum than mucus, and it was slightly pink, not rusty yellow at all. Also there was the striking fact that the patient's general condition was far worse than could be explained by the small amount of lung-disease present. So I examined the sputum under the microscope and found it full of bacilli looking like those of plague, and cultures were made from which a pure growth of the plague-bacillus was obtained. During 4th and 5th patient became steadily worse, his temperature remained about 104° and his expectoration became most profuse; the moist sounds were heard over a larger area as well as slightly at the bases; the respirations increased to 35 and then to 45 and the pulse to 120 and 135; and he ultimately died early on Jan. 6th."

The necropsy in another case showed patches of pneumonic consolidation together with general engorgement and œdema of the lungs. Mr. Hankin's report deals mainly with the best means of disinfection and he comes to the conclusion that the best disinfectant is a weakly acid solution of corrosive sublimate. The whole report is most interesting and shows a very large amount of work, most of which seems to have been done in the midst of very trying circumstances.

"A REASONABLE FAITH."

IN the *Victorian Independent*, an Australian paper, for June of this year appears a short paper by Dr. J. W. Springthorpe under the above title in which an attempt is made to give a rational basis of belief. A large number of medical men rank themselves as "Bread Churchmen"; their scientific

training is the obvious explanation of this, and Dr. Springthorpe enlarges on this theme. His language is rather terse but he is evidently a deep thinker and his views will probably be supported by many scientific men. He points out that "to thinking men and women the question of questions still remains the purport of life and the destiny of man, and upon this vital issue the science of to-day has, perhaps, arrived at three great generalisations. The first is the ultimate unity of origin of all forms of matter. Far out into the infinitudes of space stretches the impalpable luminiferous ether. Admit simply that atoms can be formed by different aggregations of its ever-moving mass and upon this almost immaterial basis we can build up the grandeur of universe." The writer then proceeds to the second point—namely, that modern science has practically proved that development is the law of life and that all forms of life have an ultimate unity of origin, and he even ventures the further suggestion that life itself may, after all, be simply a new kind of movement in molecules of a certain complexity. "But this tale of glorified matter is only half its story. For apart altogether from other arguments of weight it seems in ultimate ontology more rational to place mind behind all manifestations of matter than to regard thinking and purposive mind as evolved from insensate mass. Thus the necessary antecedent to, and correlative of, an infinite ether is an omnipresent Supreme Mind, of which, indeed, the ether perhaps may be simply the first manifestation or obverse side. The modern conception of religion thus claims to start with an omnipresent Supreme Mind." It is difficult in a short abstract to follow the whole of Dr. Springthorpe's arguments. He finally considers Christianity. "One came from the Supreme; taught that amidst His infinite attributes there is a divine humanity; proclaimed the Gospel of the Fatherhood of God and the brotherhood of man; and lived a life in perfect accord with the Supreme Will even to the death. This is the supreme fact that Christianity offers for the acceptance of the race." Then comes the point to which we have already referred, that "in its interpretations we have still to follow that evolution which is the law of our progression." It is mainly because there are in the orthodox pale so many outgrown forms and phrases and so little provision made for their own developmental needs that so large a proportion of the progressive minds of our time find themselves unable to ally themselves cordially with any special religious denomination.

INCREASE OF EOSINOPHILIC LEUCOCYTES IN TRICHINOSIS.

IN the *Journal of Experimental Medicine*, vol. iii., No. 3, 1898, Dr. Thomas R. Brown has published some important researches on the pathology of trichinosis. He finds that there are marked changes in the number and character of the leucocytes in the blood—leucocytosis with great relative increase in the number of eosinophilic cells. Normal blood contains about 6500 leucocytes per c.mm., of which 4810 (74 per cent.) should be polymorphonuclear neutrophiles and 130 (2 per cent.) eosinophiles. Ever since Ehrlich discovered the different affinities of the granules in the various kinds of leucocytes for acid basic and neutral dyes the numerical variations in disease, especially of the eosinophilic leucocytes, have been studied. A constant increase of the latter has been found in certain diseases—viz., leukæmia, bronchial asthma, pemphigus, prurigo, psoriasis, eczema, &c. The largest percentages hitherto reported are 22 in bronchial asthma, 33 in pemphigus, 24 in eczema, 27 in ankylostomiasis, and 21 in anterior poliomyelitis. In a case of trichinosis Dr. Brown observed that the number of leucocytes at different periods was 15,000, 20,000, 27,500, and 11,000 per c.mm. With this leucocytosis the percentage of eosinophilic cells showed enormous relative increases; thus they amounted at different times to 37, 10, and 15 per cent. of the total leucocytes and once they reached as high as 68·2 per cent. This relative increase of eosinophilic cells necessarily involved a relative decrease of the polymorphonuclear neutrophiles, which from 80·4 per cent. sank as low as 6·6. Further, in the muscles, especially in the degenerating areas, he found a hitherto undescribed condition—a large number of eosinophilic cells, which suggested that these cells might be phagocytic. From the constant inverse relationship between the eosinophile and the neutrophile cells and the similarity in size and character of their nuclei he infers that the former cells may arise from the latter. This change possibly took place in the muscle, for both kinds, as well as transitional forms, were there found. All these facts suggest the theory that the polymorphonuclear neutrophiles wander out of the vessels and act as phagocytes on the degenerated muscle and that in so doing they become transformed into eosinophile cells which, returning to the circulation, cause the marked increase of the latter. It is of interest that Kischensky has come to a similar conclusion regarding the origin of eosinophiles in the sputum of asthmatics. Dr. Brown thinks that the marked increase of the eosinophilic cells may prove of value in the diagnosis of trichinosis, indeed he found it so in two cases. But the whole subject of leucocytosis in disease is still in an elementary stage.

A SPANISH MEDICAL OFFICER'S EXPERIENCES IN CUBA.

DR. GONZALEZ GRANDA, medical officer of the first class in the Spanish army, has published some interesting observations in the *Revista de Sanidad Militar* of Feb. 1st, 1898, on the wounds and injuries which came under his notice during the first phase of the Cuban campaign. The cases noted are full of professional interest and the results achieved prove once more the immense value of antisepticism in the field. One soldier recovered after an exceptionally trying experience. During the engagement at Palma Soriano he sustained three severe sabre cuts, two dividing the parietal and temporal bones respectively and exposing the dura mater, whilst the third, impinging on his left shoulder, severed the upper half of the scapula. While under treatment the patient was attacked by yellow fever, but eventually he recovered and was sent to Santiago to be invalided. At Parana an officer was taken prisoner who had been hit by three Remington bullets. Two of the wounds were situated close to each other in the left shoulder running downwards and inwards and both of the projectiles had lodged in the thorax. There were severe cough, dyspnœa, and hæmoptysis. The third wound was superficial but of large size, being situated on the inner side of the left knee. Under the influence of ergotine, rest, tonic mixtures and antiseptic dressing the wounded man had recovered sufficiently in a few days to undertake a journey on horseback to San Luis. At Ramon de Guaninao a sharpshooter was wounded by an explosive bullet. The projectile entered beneath the right inguinal fold, causing comminuted fracture of the upper part of the femur. There were two apertures of exit, one longitudinal under the hip and the other star-shaped on the inner aspect of the thigh at the juncture of the upper and middle thirds. Under chloroform Dr. Granda, having opened up the wound, was able to extract seven pieces of bone as well as two strips of metal from the projectile. Recovery to a certain extent took place under antiseptics and a silicated bandage, but good bony union could not be secured owing to the excessive mobility of the short upper fragment. In conclusion, the Spanish surgeon formulates his observations as follows: (*a*) The projectiles used by the rebels were, in order of frequency, the ordinary Remington bullet, an explosive bullet, the

bullet used in the Mauser cartridge, and, finally, a repeating-rifle bullet. (*b*) Of all wounds the least dangerous were those caused by cold steel. Several moderately dangerous incised wounds are far graver than a single severe wound. (*c*) Of all gunshot wounds those due to the Mauser rifle were the least fatal. (*d*) The danger in a wound due to a Remington bullet depended chiefly on the range. Usually when a long bone was struck by a bullet the result was a comminuted fracture, but in many cases repeating-rifle bullets did not produce this effect; the leaden projectile, unenveloped by a metallic jacket, was easily deflected, causing damage to the soft parts alone. (*e*) The explosive bullets so freely employed by the rebels produced comminuted fractures of terrible extent, together with horrible crushing and laceration of the soft parts. These wounds are exceedingly grave "*quoad vitam et quoad functionem.*" The range of an explosive bullet is short, but in the Cuban war this did not benefit the Spanish troops because the encounters always took the form of surprises or ambuscades, the shooting being invariably at close quarters.

BRITISH MEDICAL BENEVOLENT FUND.

IT is sad to find that the number of medical men who fail to secure any adequate income for their declining years is by no means small and that some at their death leave families quite unprovided for. Much, however, is done by the British Medical Benevolent Fund to relieve the hardships inevitable under such circumstances. The report of the committee for the year 1897 shows that the subscriptions and donations received during that period amounted to £1367, and that the sum paid out in grants was £1236, the grants ranging from £5 to £18, and being distributed to 167 applicants out of 216. Many of these cases had to be postponed from month to month for want of funds, and there was at the close of the year an unusually large number of very urgent cases waiting for relief. Besides the recipients of grants there were 107 annuitants who collectively received £2168, one of them being a widow who is sixty-one years of age and has eighteen children. The honorary financial secretary, to whom donations and subscriptions may be sent, is Dr. West, 15, Wimpole-street, W.

SIR HENRY ACLAND ON MEDICAL MISSIONS.

SIR HENRY ACLAND has published an Address on Medical Missions in their relation to Oxford. The address was delivered in December last to the Oxford University Junior Scientific Club. It shows that despite the imperfect health attaching to octogenarian years Sir Henry Acland still takes the greatest interest in movements which contemplate the well-being of the race and especially of such portions of it as are under the direct rule of Her Majesty Queen Victoria. The address was called forth by a letter from Sir T. Grainger Stewart, President of the old Medical Mission Institute of Edinburgh in connexion with the Edinburgh Medical Missionary Society, founded by the great Dr. Abercrombie. Sir T. Grainger Stewart describes its objects and dwells upon the efficiency of religious medical service as preparing the way for still more strictly religious work. He expresses the hope that the Universities of Oxford and Edinburgh might coöperate in this great work. The society aims at sending into the missionary field only men who have enjoyed the best medical and other training that Edinburgh can afford. There is a danger nowadays of fancying that a little smattering of medical and surgical knowledge in missionaries will enable them to meet their own wants and those of the people whom they seek to benefit. This conception has no encouragement from the Edinburgh Medical Missionary Society. Still less has it any favour in the address of Sir Henry Acland which carries the conception of the medical missionary further even than that of the Edinburgh Medical Missionary Society. He would embrace within its objects whatever will benefit men physically, socially, and morally. Medicine in its large sense—scientific, preventive, therapeutic, and administrative—has relation to all races, and to every individual. It has relation to education, and therefore, to some extent to the religious life of the individual and the community. The conditions of great cities, and in a less degree of rural communities, often incompatible with decency and even hotbeds of drunkenness and vice, are the chief care of medicine, which aims at their removal and their replacement by conditions favouring virtue and religion. Sir Henry Acland's enthusiasm waxes warmer and warmer, and carries him beyond the bounds of the objects of any mere church or denomination in his conception of the objects of Christian missions. "With the divisions of the Church of Christ medicine has nothing to do." Its essential services neither favour these divisions nor contemplate them, and we should gather from his address that he scarcely approves of medical institutions working as such for mere sectarian purposes. Undoubtedly, the rule in Edinburgh is to help only the education of medical students specially recommended by any Protestant body. Sir Henry Acland would have medicine bound by no such restrictions. He admits them to be natural in the present state of the world, but thinks them unnecessary. Nevertheless, he is practical enough to recognise the good done by those who are identified with particular churches and the burden of his address is to enlarge that good and to bring to the missionary service the very latest and the very best discoveries of medicine.

NERVE DISORDERS IN ZYMOTIC DISEASES.

TWO cases illustrative of the nerve disorders which attend upon zymotic disease are described in the *Annales de Médecine et Chirurgie Infantiles* of Aug. 1st, 1898. The underlying fever in each case was measles. In both a maniacal delirium was the most marked symptom. This condition appeared in one case as a sequel on the twenty-first day of illness and was ushered in by mental depression and attended by hallucinations. This patient gradually recovered. In the other mental troubles appeared with the invasion of measles and were of similar character to those of the former case. With the appearance of rash, which was delayed till the ninth day, the nervous symptoms began to abate, but pneumonia supervened and proved fatal. The ages were thirteen and fourteen years respectively. If these data are worth anything—and they are supported by the experience of other observers — they teach the importance of the nervous element as a factor in the pathology and treatment of children's fevers. This is probably of more consequence at or about the period of puberty, though it can at no age be overlooked. It is likewise the more to be considered in connexion with cases of delayed or "suppressed" eruption. In its therapeutic aspect it must necessarily remind us of the paramount value of measures to hasten the appearance of the rash and frequently also of a judiciously sedative treatment.

THE SANITARY REDEMPTION OF HAVANA.

ONE good result which may be expected from the present war is that there will at least be a likelihood of yellow fever being stamped out in Cuba and of the town and harbour of Havana, the chief sources for spreading the infection, being thoroughly cleansed. The insanitary condition of Havana has been for many generations a serious menace to the health not only of the United States, but of all the trading nations of the world. Havana is the chief nursery of yellow fever and the principal centre for its dissemination to other

countries. According to a paper read by Dr. George Homan before the Medical Society of City Hospital Alumni of St. Louis a few weeks ago, "the harbour of Havana is a land-locked bay, deep, spacious and well sheltered on all sides. With the exception of some arms or inlets that reach in different directions the main bay or harbour proper may be likened roughly to a bottle or narrow jug with the neck set on the shoulders in an oblique direction. There are no streams of large size flowing into the bay, the Gulf tides are inconsiderable, the sewage and surface drainage of a large population have been poured for centuries into this almost stagnant basin, and with a temperature seldom falling below 70° F., the conditions afforded for breeding and storing disease are wellnigh perfect." As regards a remedy for this state of affairs it is, in the opinion of experts, but a question of a little engineering skill; in fact, it is declared by those in a position to speak with authority that by the application of certain sanitary measures Havana, from being one of the most unhealthy may be transformed into one of the healthiest cities in the world. Two means of effecting this desired change have been suggested, either that some method shall be devised whereby the waters of the bay will be regularly and frequently changed, or else that the pollution now poured into it shall be diverted and safely disposed of elsewhere. To effect the former it has been proposed to cut a canal leading from the bay to a point on the north coast with a view to establishing a current towards the Gulf. The other alternative is the diversion of the sewage now delivered into the bay and its disposal elsewhere without prejudice to public health. This would involve the construction of an intercepting sewer along the water front to receive the outfall of drains carrying domestic and manufacturing waste, and is a measure so commonly resorted to that no novelty presents itself in connexion with the suggestion. One thing seems assured, that be the difficulties in the way of the sanitary purification of Havana great or small, once the island is in the hands of the Americans their sanitarians will set themselves to the task of successfully solving the problem.

DEATH IN THE SWITCHBOARD.

ELECTRICAL fatalities are happily of rare occurrence, but when they do occur they are always of interest to the profession and the following account exhibits some unusual features. It appears that a student named Alker, aged twenty-one, with a surveyor and two firemen, went down No. 1 pit at the Park Colliery at Ashton, near Wigan. After they had descended they entered the underlooker's cabin, where a switchboard was placed with levers controlling certain electric circuits. When the party left the cabin the two firemen went first. The surveyor and Alker followed, the latter being behind. The surveyor happened to look back and then saw that Alker had hold of the switch near the door and seemed to be in pain. The thumb and one finger "were round the handle, whilst the other three fingers were on the brasswork of the board." The switch was put off by one of the firemen. Alker was caught in the act of falling and found to be dead. An electrical engineer gave evidence before the coroner as to the installation, which he said was working at a pressure of 500 volts and he stated that he did not consider such a pressure dangerous to life. It may be remembered that at the Board of Trade Conference some three years ago, upon the question of low-pressure supply, similar opinions were expressed. One gentleman said that he had felt no ill effect from a 600-volt shock. As a comment upon this there appeared at p. 1572 of THE LANCET, Dec. 21st, 1895, the following passage: "In view of the fact that so much depends upon contact and the manner of taking a shock, and that little or no information was given on this point, it is difficult to form any opinion from such a statement. Did the gentleman in question touch one pole only of a 600-volt circuit? If so, what was the earth insulation of the other pole? Was his body in contact with the earth? Or, presuming that he simultaneously placed one hand on each pole of the 600-volt circuit, what was the surface area of skin contact, and what the condition of the skin? ..... Had the surface area and condition of the skin been favourable for a low resistance contact, it is more than possible that the gentleman in question might ere this have been 'put to earth' in a sense other than an electrical one." These remarks seem to apply to the recent accident at Ashton. In the absence of more detailed information no definite opinion can be expressed. But suppose that the deceased, perhaps standing on damp ground and thereby making a good electrical contact with earth, touched with his hand one pole of a 500-volt continuous current circuit—if the other pole was earthed it is evident that a circuit might be completed through his body. It might be that the electric lighting was in conjunction with electric haulage. In such a case one pole would be earthed through the rails. Certainly under ordinary circumstances fatal accidents to human beings are not likely to happen with 500 volts, but the conditions necessary to bring about a fatal result are not at all improbable ones. Speaking broadly, it is of course correct to say that, other conditions being the same, a current is fatal in direct ratio with the electromotive force used; but these "other conditions" are second only in importance to the electromotive force itself. The contact area, the resistance of the body, the state of health of the person, and last, but not least, the duration of the shock, have all to be considered. It is not improbable that in a considerable proportion, perhaps in a large majority of cases, the fatality or otherwise chiefly depends upon the last named point. In the case under review it was with the hand closed upon the switch handle, and remaining so closed, that the shock was received. It is easy to see that the resistance of the body might be quickly broken down both by burning of the skin and by electrolytic action. Thus three of the chief factors in determining a fatal effect might here be present—viz., large contact area, low resistance of the body, and long duration of the contact. But what of the switchboard? Controlling switches such as would doubtless be used are usually of considerable size, then handles are either themselves non-conductors, such as wood, ebonite, &c., or if of metal are insulated so as to prevent current passing. If insulation of the handles breaks down the result would be the same as touching the terminals which may have been exposed. It seems probable that in the hurry to switch off and to catch up the other members of the party the deceased's hand may have slipped and touched the terminals near the handles. The accident is noteworthy, not because it throws any light upon the current that kills or because it enlightens the medical man as to the physiological mechanism of death by electricity, but because it drives home the familiar lesson that every electrical installation should be controlled by some device which may be absolutely relied upon to prevent accidental contact with a live wire.

POLLUTION OF THE MANCHESTER SHIP CANAL.

IT is a difficult task to free the Ship Canal from pollution, but the Mersey and Irwell Joint Committee persevere in their work and deserve much praise for their patient efforts in the direction of cleanliness and public health. The experts called in recently by the Manchester Corporation recommended the putting down of four small test filters and wished for a short time to investigate the results of th

treatment of the sewage by means of these filters, so that they will not be able to report to the corporation before the end of October. The corporation hope that this report when received will enable them to satisfy the Local Government Board that they can produce a pure effluent from artificial filters without having to buy additional land. If unsuccessful in this they will purchase the 200 acres required for treatment on the land which the Local Government Board has so far insisted on. The joint committee have therefore agreed to grant the corporation six months' further grace, and the summonses against the corporation have been adjourned for six months. About a month ago the Urmston and Flixton Joint Drainage Committee were summoned at the Manchester County Police-court for discharging untreated sewage into the Irwell and the Ship Canal on dates from June 15th to 29th. The joint drainage committee have a sewage farm and have allowed the farmer to take as long as he liked for cutting the grass and making it into hay, and while he was doing so the crude sewage was turned into the canal. Summonses were served on June 30th, but on July 4th the inspector found the same thing going on, and subsequently to this the local authority wrote to the Mersey and Irwell committee that they could not treat their sewage on the farm for six months, as the land was in the hands of contractors for the purpose of making additional works. Mr. Yates, the stipendiary, in the end fined the Urmston and Flixton authority, the imposed fines and costs amounting to £14 or £15, and advised them to apply to the joint committee for time in which to complete their works. Birch Park, perhaps the most beautiful of the Manchester parks, is traversed by a stream which should add to its beauties and attractions by the opportunities it gives for lake-like expansions and the ornamental cultivation of moisture-loving plants. But this brook, which sends its contribution of filth on towards the Ship Canal, has been a reproach and a by-word for years, and is, we may say, an ancient illustration of how Manchester sometimes, as in this case, allows an injurious and almost intolerably disgusting nuisance to remain unchecked. We should have supposed that every effort would have been made to prevent the air of this otherwise delightful recreation ground from being poisoned by the vile stench from this brook. In hot summer weather when the flow is diminished the nuisance becomes intensified. Perhaps the most promising way of obtaining its abatement would be to compel the Parks Committee to go under canvas on the banks of the brook for a few weeks every summer. Since the above was written the condition of the "Black Brook," as it is always called, came under the notice of the joint committee on the 8th inst., for which the corporation ought to be thankful. The pollution is said to be caused principally by drainage from houses and from a jam factory higher up the stream, within the district of the Reddish Urban District Council, who are to be informed that they must take immediate steps to stop the pollution or they will be proceeded against.

ARTIFICIAL ALBUMIN.

ALBUMIN has been described as being able alone, together with the water and salts invariably associated with it, to support the vital processes, and as the only alimentary substance which can do so. Its chemical composition is not a constant quantity, and its structure or constitution has been the subject of a great deal of speculation by physiologists. It must be accepted, at any rate, as a very complex body capable of being split up into several classes of substances. Thus the fact that it is able alone to sustain the vital processes is probably due to its being resolved or split up in the animal economy into nitrogenous waste substances, into fat and carbohydrates. This is why albumin can be substituted in nutrition for the fats and carbohydrates, but it is not adapted as an exclusive source of diet, since it presents material far in excess of the bodily needs, leading to considerable waste. A remarkable statement appeared in the daily press last week to the effect that albumin had been successfully "synthesised" by a professor at Vienna University from materials which would lead to the cheap production of albumin on a large scale. And so it has been assumed that the food problem will thus be solved. In the absence of further particulars it is difficult to set an exact estimate on the alleged discovery. If the synthesis of albumen has actually been accomplished that alone would be a fact of immense importance in physiological chemistry, but that such an accomplishment is going to revolutionise practical food questions no physiologist or sensible man will be prepared to accept in the slightest degree as probable. Pure albumin is already manufactured on a large scale and fairly cheaply too, and though the manufacture has been going on for years albumin pure and simple has not found any decided place in dietetics, nor has it been proposed to substitute it for ordinary articles of food. It is absurd to think that the time will come when we shall carry about a complete meal or dietetic outfit for the day in the shape of a thimbleful of powder. The animal economy requires other things and attributes besides the mere elements concerned in making good the waste of the tissues in the body. The importance of the discovery, however, if the announcement be correct, cannot be overrated as probably calculated to throw much valuable light on the processes of metabolism and nutrition.

INTESTINAL OBSTRUCTION BY ROUND WORMS.

THE well-known inconvenience and even danger arising from the presence of round worms in the alimentary canal receive additional confirmation from a case which is graphically described in the *Annales de Médecine et de Chirurgie Infantiles* of Aug. 1st, 1898. It is that of a child, aged nine years, who presented all the usual symptoms of intestinal obstruction with an area of dulness from 12 to 15 cm. in length, corresponding to an elongated swelling about the middle of the transverse colon. Laparotomy was performed and it was found that this swelling consisted of fæcal matter and that the colon at the junction of its left third with the other two-thirds was actually "corked" (*sic*) by a mass of cord-like substance which proved to be an entangled knot of round worms. Massage of the colon was successful in reducing the obstruction, the contents of which were pressed as far as possible towards the sigmoid flexure. The abdominal wound was then closed. The relief of symptoms was rapid and pronounced; on the third day, with the help of calomel and santonine, three round worms were passed by the anus and the child was well in a week.

AN Italian lady, Signorina Esther Bonomi, has obtained at the University of Genoa the first doctorate in medicine granted to a female student, in modern times at least, in Italy. Another lady, named Dr. Katharina van Tusschenbroek, has been appointed to the professorship of gynæcology in the University of Utrecht.

THE Home Secretary has appointed Dr. Thomas Morison Legge to the new post of Medical Inspector of Factories and Workshops. We congratulate Dr. Legge, who has done excellent work in public health and who was also Secretary of the recent Royal Commission on Tuberculosis, on his well-earned recognition.

MR. FRANCIS MARPLES, of Sheffield, has made a donation of £20,000 to the weekly board of the Royal Hospital of that city. In 1893 he presented to the Free Hospital for Children a sum of £27,000 on certain conditions, so that he has proved himself a really splendid benefactor of Sheffield medical charities.

WE may remind our readers that the Congress of the Royal Institute of Public Health will be held in Dublin from Aug. 18th to 23rd, 1898, under the presidency of Sir Charles Cameron. The honorary secretary of the Congress is Mr. Henry Campbell, Town Clerk.

IT is proposed to entertain Professor Virchow on the occasion of his forthcoming visit to England at a public dinner. Lord Lister, we understand, will take the chair and may count upon the support of the leaders of the profession.

A TELEGRAM to the Colonial Office received on the morning of Tuesday, August 9th, stated that no cases of plague had occurred in Hong-Kong last week.

THE REPORT OF THE SELECT COMMITTEE ON PETROLEUM.

THE Report of the Select Committee on Petroleum, a copy of which we received last week, is unquestionably a valuable document and contains, we venture to think, a most fair and comprehensive statement of the present position of the subject. The difficulties of legislation being directed in one way or another are carefully weighed, and it would be idle to deny that the conclusions express a perfectly impartial view of the case as they are the product of enormous labour, time, and thought. A perusal of the Report in one place would appear to carry conviction in one particular direction; at another it would appear to convey just the opposite conclusion. In a word, it is not difficult to see how sharply contention has waged round the main points at issue.

Our interest in the labours of this Committee has been centred in the one great question of the accidents arising from the domestic employment of paraffin lamps, and as our readers will recollect, we instituted a practical inquiry during the latter months of 1895, the results of which were published in THE LANCET of Jan. 4th, 1896, in the Report of THE LANCET Analytical and Sanitary Commission on Dangerous Paraffin Lamps. Our commission expressed the opinion that if legislation could be directed to the construction of lamps all that was needed to avert further dangers would be done. It was shown very distinctly that the chief source of danger arose from cheap lamps or from lamps of defective design and construction. The evidence of experience, it was pointed out, was quite in agreement with this conclusion, for the disasters that have been reported have been in almost every instance in the houses of poor families where the cheapest possible lamp was in use. There is no similar record of accidents published in the case of those who use lamps and can afford to pay a reasonable price for those of sound and safe construction. Yet the class just referred to are great patrons of the oil lamp using the ordinary oil of a flash-point of from 73° F. to 85° F. This difference may be due to the exercise of greater care and intelligence in the latter case. Against recklessness and carelessness no legislation is possible. THE LANCET Commission attributed most of the accidents to the leakage of oil through imperfect connexions and fittings, to the fragile character of the reservoirs, and to the oil becoming ignited on the lamp being upset. No satisfactory evidence could be obtained from the series of experiments made that a real explosion was a likely occurrence. Not in a single instance did an explosion result. The evidence placed before the Select Committee on Petroleum pointed distinctly to the same conclusion. Thus on page 15 of the Report occurs the following passage: "The Committee have received a large amount of evidence as to the special causes of lamp accidents. A large number of lamp accidents are reported as lamp explosions which it would appear from the evidence are not explosions at all. There is very weighty scientific evidence to the effect that actual explosions in lamps are extremely rare and that the conditions necessary to cause an explosion very seldom occur. It appears from this evidence that vapour when produced in a lamp is only in an explosive condition when mixed with atmospheric air in nearly the proportion of two parts vapour to ninety-eight parts air. It can then only explode if, through defects in the lamp, by blowing down the chimney, through an ill-filling wick or from some other cause, it comes into contact with the flame of the lamp. When the proportion of 2 per cent. of vapour increases, say, to 4 per cent., the mixture is no longer explosive. This is given as an explanation of the statement that explosions in petroleum spirit lamps are practically unknown as the vapour is generated so rapidly that the explosive point is past almost immediately the lamp is lighted." If this be so the possibilities of an explosion happening with high flash-point oil are greater than with the low flash-point oil.

Statements have been made from time to time in the newspapers that England was the dumping ground of the refuse oil of the United States, where, it was asserted, that legislation absolutely forbade its use. On page 13 of the Report of the Select Committee we read: "The Committee have taken a large amount of evidence as to the statement so frequently repeated that this country is made the sole market for oil of such a dangerous character as would not be allowed to be used in the United States or elsewhere, and have come to the conclusion that the statement is unfounded. Petroleum of 73° (Abel) is not only largely used in the United States but is chiefly exported to the principal European and Eastern countries." A more complete refutation of such statements could not have been made. We have not space to deal with the mass of material embodied in the report, but it is a satisfaction to us to find that many of the vital points contained in the conclusions of THE LANCET Commission were correct and in an exact line with the findings of a Parliamentary Committee which has been holding an inquiry extending over several years and which held fifty-three sittings and examined no less than eighty-five witnesses, the latter including scientific experts, traders in, and manufacturers of, both oil and lamps, and public officials. Nor were we alone in taking the view that the remedy lay in the State insisting upon a standard of construction for lamps instead of interfering with the present flash-point of the oil. "The evidence of this branch of the inquiry," it is stated in the Report, "is most conflicting and contradictory both as to the efficiency of the proposed remedy and as to what should be the particular flash-point if one should be adopted. Many witnesses contended that lamp accidents would be largely diminished, if not entirely prevented, by the prohibition of the sale or use of petroleum below a certain flash-point for illuminating purposes." On the other hand, "From the evidence before them by witnesses who have had long experience the Committee have come to the conclusion that lamps reasonably well constructed and used with a fair amount of care are safe with all ordinary oils."

After all the conclusions summarised in the Report are in the nature of a compromise, for the Committee recommend in paragraph 2 not only the adoption of a flash-point of 100° (Abel close test) as the dividing line between petroleum oil and petroleum spirit, but in Section 7 that statutory powers should be created to enable the Secretary of State to issue orders affecting the manufacture and sale of lamps, and lastly, in Paragraph 8, that information should be spread among the public as to the nature of petroleum and the management of lamps. The effect of legislation on the lines thus suggested cannot be predicted, and the validity of these conclusions can only be judged when we are in a position to turn to the evidence of experience. In conclusion we may repeat a remark which we made in an article upon the subject in THE LANCET of July 2nd, 1898, viz.—"if our attitude (that adopted in the report of THE LANCET Commission) should ultimately prove to be wrong we shall none the less welcome any alternative proposal, should it be followed by a happy issue, from whatever lines of reasoning it may have sprung. Let the flash-point be raised by all means if that will protect life and limb, and if at the same time it will not engender other hardships in the every-day conduct of human affairs."

A NEW SANITARY SERVICE AT BORDEAUX.

(FROM A SPECIAL CORRESPONDENT.)

THE town of Bordeaux has established a new system of sanitary control which seems likely to pave the way to a very great improvement in the condition of that important city. What is called the service of *l'inspection technique de la salubrité* was founded in 1897 by the new municipality elected in 1896. There was formerly a *médecin inspecteur de la salubrité*. He had no office at the town hall. His mission was to examine unhealthy districts, badly kept streets, and general causes of insalubrity. He was also the inspector of unwholesome industries. This function has now been suppressed and replaced by the *adjoint à l'hygiène* of the mayor, who must be a medical man, and by the new "technical service of salubrity" which must be under the direction of a sanitary engineer. The *adjoint* or substitute of the mayor thought it was necessary that he should be assisted by a technician knowing the detail of sanitary appliances, the cost of sanitary apparatus, the value of new patents, processes, &c. Hence the service of technical inspectors was organised. Its duties extend over many questions which were not included in the attributes of the *médecin inspecteur de la salubrité*. Apart from watching the causes of ill-health and inspecting unwholesome industries, which were the duties of the former medical inspector, the new service has organised an elaborate system of inspection over private dwellings. Throughout France there exists in all important centres an official "commission on unwholesome dwellings." But at present this commission only interferes when the householder will not carry out the improvements which have been suggested to him. If a complaint is made concerning the sanitary defects of some dwelling it is sent to the new service, which at once makes a report, indicates to the proprietor of the house in question what alterations are necessary and generally these suggestions are carried out. It is only in the event of refusal on the part of the proprietor that the matter is handed over to the "commission on unwholesome dwellings." This commission generally prescribes the same or similar remedies, and the measures thus recommended can then be presented to the municipal council. If they are approved by the council—and this is generally the case—then the proposed remedies can be enforced by law. Should the proprietor still refuse to comply he falls under the law of April, 1850, and a penalty can be inflicted. Unfortunately this penalty consists only of a fine, there is no power by which the sanitary improvements can be carried out in spite of the householder or proprietor. Therefore if the fine inflicted is less than the cost of the proposed improvements the house-owner pays the fine and the matter is allowed to drop. A project of law is now under consideration by which when such sanitary measures are approved by the municipal council the mayor will have the right to carry out the works himself and recover the costs from the proprietor by summary proceedings. In consequence of the arrangement just described the number of cases referred to the "commission on unwholesome dwellings" has been very much reduced, and this is only fair, as the members of that commission are not paid for the work which they perform.

Then there are many causes of complaint which come under the existing laws and it is not necessary to refer to the "commission on unwholesome dwellings" to have them rectified. Thus, for instance, if there is a heap of manure or there are some poultry in a backyard the police inspector can at once interfere. The "commission on unwholesome dwellings" has now therefore only to attend to cases where a recalcitrant house-owner refuses to comply with instructions given him or when some very serious measure is proposed such as the total evacuation and demolition of dwelling-houses. Then when sanitary works have been ordered there must be an inspector capable of seeing that they are properly carried out. With a service technically competent many questions which would lead to much debate and dispute can be settled at once.

Apart from the houses which already exist there is the question of the new houses which it is proposed to build. The plan of all new structures has to be sent to the town hall. These plans were formerly examined so as to see that the new building should be in harmony with the street and its surroundings, but no note was taken as to what would be its probable sanitary condition. Thus it sometimes happened that two or three years after a house had been built it was condemned by the "commission on unwholesome dwellings." It is true that the law of 1852 says that plans of proposed buildings shall be examined from the health point of view but the law does not state who shall be held responsible for the accomplishment of this duty. Therefore what was no one's business was never done; besides, there was no recognised authority technically capable of carrying out this clause of the law. The creation of the new technical service of sanitary inspection provides the machinery by which this long dormant law can at last be enforced. The plans for new buildings are now examined from the sanitary as well as from other points of view.

Another important duty devolving on the new sanitary service is the control of the emptying of cesspools. The company which has contracted with the municipality to do this work is bound by a set of regulations drawn up and accepted in 1874. But it was very urgent that there should be municipal officials ever on the watch to see that these regulations were strictly enforced. Then it is not only necessary that a cesspool should be properly emptied: it must be carefully examined to see that it is thoroughly water-tight. When a cesspool is reported to be leaking an inspector is sent from the town hall to verify the fact. When only solid matter is drawn out of a cesspool it is evident that the liquids have escaped. The inspector indicates what repairs must be done, and when they are completed the cesspool is closed in the presence of the inspector. He then affixes the municipal seal on the cement. Otherwise some householder would be tempted to reopen the cesspool so as to damage the walls and render them porous. The liquids would then escape and a long time would elapse before he would have to incur the expense of having the cesspool emptied again. At Bordeaux this is a particularly expensive operation. It used to cost nine francs per cubic metre, but now the charge has been reduced to six or seven francs. There is a project under consideration for the drainage of the town, and if this is carried out all the cesspools will be abolished. But a vast and costly scheme of this description is not likely to be promptly realised. Therefore it is very important that, in the meantime, the nuisance due to the cesspool system should be reduced to a minimum. Fortunately, in many parts of Bordeaux the landlords are as anxious as the municipality that their cesspools should be water-tight. In these districts the cesspools are below the underground water-level; therefore if they were not water-tight they would drain the surrounding subsoil, fill rapidly, and have to be constantly emptied.

The new technical sanitary service has under its charge the management of the municipal disinfecting station. This has been admirably organised. In a spacious, well-aired building there is a very large Geneste and Herscher stove. It measures 1·90 metres in diameter and 4 metres in length. Of course, the side for the admission of the infected linen, &c., is completely walled-off and separated from the side where the linen is taken out of the stove. The disinfectors wear a sort of uniform consisting of white overalls and a cap with hood covering the back of the neck. When they have placed everything in the stove they take off their uniform and put it in also. After this a side door admits them to a bathroom and disinfecting room where they change their other clothes and wash thoroughly. A very effective check is kept over each operation. On a printed formula the blank spaces are filled in and indicate accurately what has been placed in the stove, where it came from, and the nature and result of the illness of the patient. Attached to the disinfecting stove there is a registering thermometer. The slip of paper fastened to the drum of the thermometer bears the same date and number as the formula containing the list of the objects to be disinfected. The drum revolves by clockwork and on the paper is inscribed minute by minute the temperature prevailing in the stove during the operation. The two sheets are then pinned together. If any question arises or complaint is made these two documents are produced and it is at once seen to what temperature the objects have been exposed and for how long. By this means, also, it is easy to verify if the steam under pressure has been occasionally let off and the pressure reduced. If this is not done there is always the danger that a layer of compressed and cooler air will form within the stove and unless this is broken up by a sudden change of the surrounding pressure the same amount of heat will not

be evenly distributed over all the objects to be disinfected and the operation may not prove entirely successful. The clockwork thermometer is therefore a very practical and necessary adjunct to a stove for disinfecting by steam under pressure. The disinfecting is done gratuitously for the poor and a moderate charge is made where the persons concerned can afford to pay. A great many private families send things to be disinfected and sometimes even when this is in no wise necessary. Thus the bedding, &c., of a person who had died from diabetes were sent to be disinfected. The practice of disinfecting for cases of phthisis is also much on the increase, and as these patients often live a considerable time disinfecting for them brings in a small regular income. The *Mont de Piété*, or State pawning establishment, has likewise entered upon a contract with the municipality by which it pays £60 a year to have all the bedding pledged disinfected before it is stored away. Hopes are entertained that a by-law will be enacted at no distant date by which all auctioneers will be compelled to have all bedding disinfected before they take it to public sale-rooms. As it is, some auctioneers have already taken time by the forelock and voluntarily bring the bedding they have to sell to be disinfected. Of course they do not fail to boast of the precaution they have taken, produce the municipal certificate of disinfection and charge a heavier price accordingly. The public has, on its side, the intelligence to appreciate this proceeding and is willing to pay more for greater security. From these various sources, the income derived for disinfecting during the first month of this new service amounted to £28, so that the cost the municipality has incurred is likely to be covered by the receipts.

Cheap lodging-houses are under the supervision of the police; but now when the police are asked to authorise the opening of such a house they first consult the sanitary technical service. It is only when the recommendations made by this service have been carried out that the police authorise the taking in of lodgers. Unfortunately there is no precise law on this subject. The custom is to insist that there should be 20 cubic metres of space per head per night, but the whole matter is left to the discretion of the local authorities. A Common Lodging-houses Act, similar to Lord Shaftesbury's Act of 1851, is much needed in France. If Zola or Daudet could have written a novel something like Dickens's "Bleak House" such an Act might now be in force among our neighbours.

The new "technical sanitary service" has also to control all subsidised localities—such as theatres, *crèches*, schools, &c. In these establishments it insists on greater cleanliness than has as yet been observed; the walls are more frequently whitewashed and the drains more carefully looked after. The new service has likewise to report on all sanitary questions interesting the municipality, and for this purpose occasionally deputes a delegate to attend sanitary congresses and to visit foreign towns.

Somewhat after the model of what is being done for the Paris Municipality by Dr. A. J. Martin and M. Masson the Bordeaux "technical sanitary service" is seeking to establish a sanitary record for every house in the town. Some confusion has arisen as to what this means. The danger is that a house once visited and reported upon may be considered as having obtained a sanitary certificate and this may lead to a false sense of security. The persons employed to make these inspections are municipal agents or beadles. They are called *appariteurs* and their function is to report all defects in the public services. If the dust is not satisfactorily removed, the street is insufficiently watered, or any by-law is not properly carried out, complaint must be made to the *appariteurs* of the district. These men have no special knowledge of sanitary questions, but they have an intimate practical knowledge of the district in which they work, and some of them have worked in the same district for more than ten years. Bordeaux is divided into twelve districts. There are two *appariteurs* for each district and they are expected to inspect two houses per day. 2000 houses have already been inspected. There are about 36,000 houses in Bordeaux, so that it is anticipated that the work will be completed in some two years time. It is urged that these men, though not technically instructed in matters appertaining to sanitary engineering, are quite competent to answer the questions put down on a printed formula which they have to fill up whenever they visit a house. They must state when the house was built, what is its size, its frontage on the street its depth; the size and number of gardens or courts, the state of the soil, their ground level as compared with that of the street; what trades, shops, or businesses are carried on; the stables, their number, and the number of horses contained; the number of separate tenements, on what floor they are situated, whether they give on to the street or on to a court or garden, whence they derive their air supply and the number of inhabitants. These questions complete the first or white folio that has to be filled up. The second or pink folio deals with the sanitary conditions of the house. It is first necessary to state whether the house receives the town water supply, whether the supply is direct or whether there are cisterns, whether there is a meter and if so the duration of the subscription. Secondly, and in case the house does not receive the town supply, it is necessary to state at what distance is the nearest public fountain, whether there are any wells, where these are placed, what use is made of them, whether the waters have been analysed, and what decision was taken in consequence of such analysis. Then it is necessary to state how many closets there are in the house, whether they are private or used by more than one family, where they are placed, what is the nature of the seats and basins, the water-supply, the flushing apparatus; the soil-pipes, their situation, nature and condition; the ventilators, their origin and dimensions; the cesspools, whether water-tight, automatic or moveable, or whether the closets drain direct into the sewers. The methods of draining off the slop and rain-water have likewise to be described, and an account has to be given of the stables, the animals living in the house, and the manure heaps that may be on the premises. On the back of this sheet there is a space where diverse causes of insalubrity may be more fully detailed, together with the measures of improvement prescribed, and finally there is space for a record of what has been done as the result of these recommendations. The third folio is blue and deals only with lodgings recognised as insanitary and serves to tabulate the improvements ordered and the consequence of such action. The fourth folio is yellow and deals only with infectious diseases, the nature of such diseases, the date at which they were notified, the methods of disinfection employed, the death or otherwise of the patient. A fifth and green folio is devoted exclusively and in more detail to the disinfecting operations. All these five sheets are pinned together in a stiff wrapper but are sufficiently small to be carried about and filled up on the spot. It is maintained that when the above questions have been fully answered a very complete record of the house has been obtained. Such a record is not a certificate of efficient sanitation, but it is a basis on which further inquiry may be made when the occasion arises. By giving a different colour to the folios, according to the subject with which they deal, a question is quickly answered not only with regard to one house but with regard to a whole series of houses. With such a record at their disposal it will be much easier for the sanitary authorities to connect the outbreak of epidemics with the internal conditions of the dwellings concerned. The sanitary history of each house will thus be gradually built up and its value as a sanitary dwelling ascertained. The advantage of employing the *appariteurs* for this service is that they know every one. It is their business to distribute the voting cards to all the electors. They attend to all questions relating to water-supply, complaints as to the condition of the streets, the tables of cafés encroaching upon the causeway, dust removal, the numbering of houses, the registering of horses for the military reserve, the dog tax, accidents, flower-pots falling into the street, &c.; in a word, the *appariteur* is the man who always *appears* when anything goes wrong. From the sanitary point of view the great advantage rests in the fact that he is the representative of the mayor, and, therefore, carries the tricolor scarf and the silver medal with him. On an emergency he can put on these insignia of office and then he has the right of entrance both day and night into private houses as well as into public places. Sanitary inspectors have no such right for they are not recognised as agents of the law.

The new technical sanitary service has also to look after the disposal of house refuse. This is placed in boxes which are put out into the streets at night and collected in carts in the early morning. The carts are taken to the banks of the Garonne and emptied at a spot which is comparatively isolated though not far from the centre of the town. The carts are ranged in order on a landing stage

and tilted up so as to be emptied into barges below. There is also an embankment where other carts empty into railway trucks beneath. As the contents are raked out of the carts and pushed so that they fall into the trucks or the barges the men pick out the hard core, which they place in bags or hampers, and it is used for road-mending, &c. The soft core is then conveyed either by rail or by boats to agricultural districts where it is readily disposed of as manure.

Such are the principal functions of the "service of technical sanitary inspection" recently established at Bordeaux. Much of this organisation is due to the ingenious conceptions and activity of Monsieur E. d'Esménard, civil engineer and founder of the Society of the Sanitary Engineers and Architects of France. It may be remembered that in July, 1895, THE LANCET gave at some considerable length an account of a Congress on Hygiene held by this society at Paris. M. d'Esménard was the general secretary of this congress and it seems that the discussions which he was instrumental in bringing about have borne fruit. In any case the town of Bordeaux may be congratulated upon having taken an important step in the right direction and in having appointed M. d'Esménard as the chief of its "service of technical sanitary inspection."

LORD LISTER ON THE VACCINATION QUESTION.

THERE can be no doubt that Lord Lister's words upon the Vaccination Bill were awaited with much attention by the country and that his opinion has been an important factor in the passage of the Bill through the House of Lords under circumstances that are familiar to all our readers. We reproduce Lord Lister's speech in full that medical men may see exactly why the representative of medicine in the House of Lords voted as he did. Details of the different debates will be found in the columns usually devoted to Parliamentary proceedings.

Happily, said Lord Lister, it is not necessary to advocate the cause of vaccination. The great majority of the Members of the House of Commons—and I trust every Member of your Lordships' House—are aware of the enormous benefits which vaccination confers. The only question is, What are the best means of promoting vaccination in the country? It is to be observed that if the amendment to omit the clause is passed the result will not be the passing of the Bill without the clause objected to. The Bill will inevitably be sent back to us from the Commons with that clause re-introduced and the consequence will be that the Bill will be thrown out for the session. Not only so, but I am given to understand that if this Bill, which is framed very much on the lines of the Report of the Royal Commission, is thrown out this year it is not likely that the Government will introduce another Bill next session dealing with the subject, and very probably not in the year after, nor perhaps for many years to come. Therefore what we have to consider is whether it is better for us to pass this Bill in the form in which it is sent to us from the Commons, or be content to let the subject of the administration of the vaccination laws remain in the position in which it is. After giving the subject the best consideration in my power, my impression is that it would be better to pass the Bill as it is sent to us than to have no Bill at all. If after the long labours of the Commission and the endeavours of the Government nothing whatever were done by Parliament in regard to vaccination I think the result would be to cast discredit upon the whole subject. It is not as if the present compulsory system were working well. The appalling fact is that at the present time about one-third of all the infants born in England and Wales are at present not vaccinated. It is also true that nearly one-quarter of all the guardians throughout the country fail to put the vaccination laws into operation. This is a highly unsatisfactory state of things and it is undoubtedly the result of the anti-vaccination crusade. The anti-vaccinationist has two weapons. One of these is the supposed possible dangers of vaccination and the other is the martyrdom which it is thought is endured by persons who are subjected to fines and imprisonment for disobeying a law which, rightly or wrongly, they believe subjects their children to danger. Now, as regards the former of these weapons—the supposed dangers of vaccination—the glycerinated calf lymph will remove it. With arm-to-arm vaccination the danger does exist, though a very very remote one, of introducing into a child the terrible contamination of syphilis. Now, this danger is absolutely done away with by the use of calf lymph, since syphilis cannot occur in the calf. Then, the introduction of tubercle by vaccination is equally prevented by the use of the new lymph. Tubercle can, indeed, affect the cow, and, though very rarely, the calf; but it has been found that if tubercle bacilli are actually mingled with the glycerinated lymph in the course of a time far short of that at which the lymph would be issued for use the bacilli have lost their vitality. There remains the possible danger of communicating erysipelas. This cannot be done by the lymph as such, for the microbes which are the essence of erysipelas are as effectually disposed of by the glycerine as are the microbes of tubercle. But there is the possibility of the communication of erysipelas to the incisions made in vaccinating, just as there is the possibility of communicating it to any scratch or sore in a human being. That is a possibility, and it would undoubtedly be diminished by having the children vaccinated at home as is proposed in this Bill, instead of having them crowded together at the vaccination stations. But I trust that before very long any possibility of the communication of erysipelas by subsequent contamination will be done away with. The medical officers of the Local Government Board have now under consideration what would be the best, simplest, and most effectual means of using antiseptic measures for the treatment of the scratches—measures which will be simple and efficacious from the antiseptic point of view, and, on the other hand, not interfering with the efficacy of the lymph. I feel certain that the thing can be done. In the medical journals papers have been published by gentlemen who show that they have used antiseptic measures with perfect success in regard to vaccination. When this is accomplished there will be absolutely no objection to the vaccination of children on the ground of possible danger. But the conviction of the absolute safety of the process will take a long time to establish itself in the country. At the present time there is a deep-rooted idea, derived from the propaganda of the anti-vaccinationists, that serious danger exists; and it will take a long time before that idea is dissipated. The second weapon of the anti-vaccinationist—namely, the martyrdom of the honest objector—would of course be struck out of his hand at one stroke by the present Bill. It has been said that this conscience clause introduces a new and dangerous principle into our legislation. It may be so; but when I see that such a conscience clause was unanimously recommended by the eminent men who constituted the Royal Commission, including so distinguished a lawyer as Lord Herschell, I feel that I am free to consider this proposal on its merits otherwise. What is likely to be the effect of the Bill if passed into law? On this point we find the utmost discordance of opinion among medical men themselves. Some feel sure that the result will be an enormous diminution of vaccination throughout the country and a consequent increase of small-pox. Other men of high position and large experience in sanitary matters are equally confident that the Bill would greatly increase the amount of vaccination. As to which of these opinions is really correct I confess that I am hardly prepared to give an opinion. Those who hope good from the passing of the Bill think that when the conscientious objector has been so amply provided for, the guardians who now object to enforce the vaccination law will not hesitate to prosecute persons who, from mere idleness and without any real objections, neglect to have their children vaccinated. That this hope is not altogether without foundation we have a good illustration in a letter which appeared in the *Times* the day before yesterday from Sir Walter Foster. I will read to the House an extract from this letter—

In 1897 the Barton Regis Board of Guardians, in face of difficulties in enforcing the vaccination laws, adopted (of course without legal sanction) the recommendation of the Royal Commission. They informed the parents who had not submitted their children for vaccination that they (the guardians) would not proceed against them for default if a declaration of conscientious objection was made before a magistrate. In the Barton Regis Union in the last half of 1897 there was a population of over 200,000, and the number of births was 2,944. The defaulting parents were 350, and the actual number of declarations 130. Major Rumsey, the ex-chairman of the board, writes me:—

"The number of declarations (130) bore about the same proportion to the defaulters as the prosecutions under the Vaccination Acts did prior to the form of statutory declaration being adopted. The Barton

Regis Guardians (44) were nearly equally divided in opinion upon the vaccination question, but from the time of the adoption of the declaration the anti-vaccinationists offered no objection to the prosecution of those who did not furnish a declaration and a most disturbing element to the harmonious working of the board was removed. I may add that, had not the statutory declaration been adopted, a resolution would have been passed refusing to order prosecutions, and so the whole 350 would have escaped vaccination in place of the 130 referred to, the remaining 220 having no objection to vaccination, but being simply negligent or careless and requiring pressure."

In other words, the announcement of the remission of penalties for those who made a declaration of conscientious objection, together with the threat of their enforcement for others, induced nearly two-thirds of the whole number of defaulting parents to submit their children to vaccination. So far as one case can go, this seems to me most encouraging. It is to be observed that this Bill by no means entirely does away with compulsion, though it is commonly spoken of as if it did so. Those parents who refuse to make a declaration of conscientious objection before the magistrate may be fined or imprisoned as under the existing law for not having their children vaccinated; but, beyond that, the fact that the parent is obliged to appear before the justices is a mild form of compulsion. It gives the parent trouble and it will be a question with him whether it is more trouble to go before the magistrates or to have his child vaccinated under the very much less troublesome form provided under this Bill—namely, having it done by the vaccinator at the man's own house. If it turns out that the results are not so satisfactory as regards the behaviour of the guardians as may be hoped, it would be very easy by a simple Bill to arrange that the administration of the vaccination laws should be transferred from the guardians to the sanitary authorities, or at any rate to arrange that the vaccination officers shall have the expenses of prosecution which are now refused by the guardians paid to them either through compulsion of the guardians or by the State. Therefore I must confess that I am disposed to be hopeful as regards the effect the Bill in its present form is likely to have. But there is one serious omission from the Bill, and that is that it neglects to deal with revaccination. It is a matter of bitter disappointment to the medical profession of this country that revaccination is not dealt with by the Bill. The immense value of revaccination has been shown by the splendid results obtained from it in Germany, in the army, and more recently throughout the population. The value of revaccination is also indicated by the figures quoted by the Commission as to its effects in diminishing death from small-pox in our army and navy and postal service. The immunity of nurses in our small-pox hospitals, who are always revaccinated before admission as nurses, is another most striking proof of the efficacy of revaccination. The Royal College of Physicians of London have lately made the following declaration:—

> The Royal College of Physicians, having learnt that certain changes are likely to be made in the laws relating to vaccination, think it their duty to reiterate their conviction that vaccination, properly performed and *duly repeated*, is the only known preventive of small-pox.

In the *Times* this morning there is published a declaration of the Royal College of Surgeons of England, in which the following passage occurs:—

> We are, moreover, firmly convinced that revaccination is an additional safeguard and should be universally practised.

It is true that several members of the Commission considered that compulsory revaccination was so surrounded with difficulties that they were not able to recommend it, but two of the most influential members of the Commission, Sir William Guyer Hunter and Mr. Jonathan Hutchinson, thought that in spite of those difficulties revaccination ought to be made compulsory. And those Commissioners who were of the opposite opinion made this significant declaration:—

> Again, it is impossible to leave out of sight the effect that such an extension of the present compulsory law might have in intensifying hostility where it at present exists and even in extending its area, though if our recommendations, especially that which exempts from penalty those who honestly object to the practice, were adopted, this objection would be much diminished.

In the present temper of the House of Commons and of the country it would indeed be hopeless to attempt to introduce compulsory revaccination on the lines on which infant vaccination is now compulsory. But the conscience clause of the present Bill opens the door for very valuable legislation on this subject. It could be arranged, with a little assistance from the Education Department, that every master or mistress of a school where children of the age of ten years attend should keep a list of the names and addresses of those who had reached that age. Then the vaccinator could look in from time to time, at whatever periods it might be thought desirable, to see from the mere inspection of the arms of the children, which of them had not been recently vaccinated and the parents of these would be dealt with as this Bill proposes to deal with parents who have neglected to have their infants vaccinated, including the offer of doing the operation at home. This would ensure the revaccination of the vast bulk of the population, except the children of the so-called conscientious objectors, who, under the new system, would, I believe, be a rapidly diminishing quantity. Another effect of this arrangement would be that many children who had not been vaccinated in infancy would be dealt with at the age of ten. Personally, I should like if the Bill could be withdrawn this year and brought in again next year with this question of revaccination attended to, and also some other matters which the Commission recommended, but which are not dealt with in this Bill. But I fear that is a hopeless suggestion. However, as regards revaccination, the members of the Government who have been approached on the subject have given us good reason to hope that a Bill dealing with revaccination may be brought in next session. Such a Bill would, I think, be sure to pass the House of Commons, the great majority of which, however they may differ on other questions, are at one as regards the importance of revaccination. The medical Members of Parliament are certainly at one on this point. The Bill would therefore readily pass, and by introducing it the Government would do untold benefit to the community. The confident hope that the Government will see their way to take this course next session makes me the more readily acquiesce in what I confess is a tremendous experiment.

ANNUAL REPORT OF THE METROPOLITAN ASYLUMS BOARD.

FIRST NOTICE.

IT cannot be said that year by year as we take up this report and read of the isolation accommodation of the county of London that the problems connected with the isolation of infectious disease seem nearer solution. Indeed, as we peruse its pages and discover the enormous provision which has already to be made we cannot help reflecting on what the future may bring forth. Suppose, for instance, that what may be called the public health conscience turns itself to deal seriously and adequately with such diseases as measles and whooping-cough, and suppose still further that it were to set itself the task of isolating in special hospitals persons whose sputum yielded on examination the tubercle bacillus. However, progress in this direction will at least be gradual and we shall have ample time, as step by step is taken, to reflect on the situation. It is, however, otherwise with another disease, namely, small-pox, and it may be, with the House of Commons in its present frame of mind *quâ* compulsory vaccination, that the near future may have in store for us a demand upon the isolation accommodation—not only of the metropolis but of the country as a whole—which the provision at present existing will be utterly inadequate to meet. So far we profess, in London at least, to provide accommodation for a relatively well *primarily* vaccinated people and we have already had indications of the difficulties of doing even this when a wave of small-pox of at all an epidemic type visits us. The tale which may be told in the future when a similar wave passes over a much less well vaccinated people may, however, be very different, and we could well understand it if the Metropolitan Asylums Board considered it a duty, both to the ratepayers and to the public health of the metropolis, to utter a solemn protest against this prospective sacrifice of human life and against this prospective increase of expenditure which is likely to occur unless some better provision is made for revaccination. It is satisfactory, however, to know that the Government intend to introduce a Revaccination Bill next session.

In the volume before us the Statistical Committee commence their report by a reference to the increased responsibility which during 1897 has been placed upon them in being constituted the authority for dealing with poor children suffering from contagious diseases of the eye and skin or who are suffering from physical, mental, or moral deficiency;

and as to their duties in this direction they will doubtless have more to tell us next year.

Coming now to infectious diseases we find that out of 45,417 cases notified during 1897 as many as 39,251 were eligible for admission to the managers' hospitals. Out of this total 58·5 per cent. were actually admitted, a percentage considerably in excess of that of any previous year. Up to about the middle of July all scarlet fever *applicants* were admitted, but from the middle of June to the middle of December a certain percentage of the applications had to be turned away.

Of the admissible cases of each of these diseases isolated by the Board there were actually admitted during the year 1897 of scarlet fever 66·99 per cent., of diphtheria 51·64 per cent., of enteric fever 30·36 per cent., and of typhus fever (4 cases only) 50 per cent. Spot maps are furnished with the report showing the distribution of each of these diseases during 1897, and it is of some interest to note that around none of the hospitals is there any such special incidence of any of the diseases isolated as has so often been the case with hospitals used for the isolation of small-pox. Why should we not around ordinary fever hospitals see some evidence of what is alleged by some to be maladministration? As regards the age and case distribution of scarlet fever and diphtheria the figures for the year show nothing new—i.e., two-thirds of the total cases were among children under ten years of age, scarlet fever being most prevalent at ages from five to ten and diphtheria at ages under five.

Now with regard to the fatality-rate of the several diseases admitted. The 15,115 scarlet fever cases yielded a fatality rate of 4·06 per cent. as against one of 4·2 per cent. in 1896, the rate amongst the males being as usual in excess of that amongst the females. The highest fatality-rate was amongst children under five years of age, the first and second years of life being the most dangerous periods. The figures relating to diphtheria are obviously of especial interest just now and it is most encouraging to find that the fatality-rate for 1896 was the *lowest on record*—i.e., 17·4 per cent., or 3·6 per cent. below that of 1896. The figures for the years 1888 to 1897 show that the maximum mortality occurs in the first two years of life, the minimum (3·84 per cent.) being reached at the age-period twenty to twenty-five. The fatality-rate amongst the 664 cases of enteric fever was 18·7 per cent., or 2·5 per cent. higher than in 1896.

There were but 70 cases of small-pox admitted either into the hospital ships or at South Wharf in 1897 and of this number 13 died. Amongst 53 vaccinated cases there were 5 deaths, none of persons under ten years of age. Amongst 4 cases having "no evidence as to cicatrices" there were 3 deaths, all of persons over ten, while of the 13 persons whose vaccination cicatrix was "absent" there were 5 deaths, 4 of which were of children under ten years of age. Of the 82 members of the staff—such as medical men, nurses, wardmaids, and laundrymaids—who were brought more or less in direct contact with infection not one contracted the disease, and the same remark has to be made as to 114 other members of the staff employed about the premises either permanently or temporarily. Of the 70 cases of small-pox above referred to 47 were, it appears, to be traced to a previous case of the disease which occurred on board a Peninsular and Oriental steamer, and which, it is presumed, was the indirect cause of conveying the disease to an unvaccinated child who was subsequently removed to the Camberwell Infirmary, where the disease was not recognised until this case had been instrumental in conveying the disease to others.

The cases of mistaken diagnosis which figure in the reports of the Asylum Board are always of interest and it must be said that the figures for 1897 are not as encouraging as we might have hoped with the clinical teaching now available at the fever hospitals. No less than 5·3 per cent. of the patients were, after admission, found not to be suffering from the diseases for which they were admitted. Of 466 cases certified as suffering from scarlet fever 62 had measles, 115 tonsillitis, and 66 "no obvious disease," while of 643 cases certified as diphtheria 31 had measles and 551 tonsillitis. Of 293 cases certified as enteric fever 4 had bronchitis and 61 lobar pneumonia. The most startling figures have, however, concern with small-pox, and we learn that of 121 cases certified as suffering from that disease and removed to the wharves for transmission to the hospital ships no fewer than 52, or 42·9 per cent. of the cases, were not small-pox. Fortunately the vast majority of these mistaken diagnoses were intercepted at the wharves and did not find their way to the ships. In connexion with the valuable ambulance work done by the Asylums Board it may be noted that within recent years three new ambulance stations have been opened. The Park Hospital began to receive patients on November 8th of last year and the Grove Hospital will add 520 beds to the accommodation available. It will then remain to complete the erection of the Southern Convalescent Hospital and the carrying out of certain works at two of the existing hospitals, when there will be provision for over 6000 fever and diphtheria cases exclusive of the 740 beds at the Gore Farm Hospital. In spite of all this the statistical committee observe almost in a tone of despair that although the accommodation has now reached a magnitude of which no one dreamt even as recently as five years ago, nevertheless, for the fifth year in succession it has failed to meet the demands made upon it. In the matter of the proportion of staff to patients we learn that in the acute hospitals the proportion ranged from one *nurse* to 3·0 patients at the Western Hospital to one to 4·0 at the North-Western Hospital, the total staff at the former hospital being one to 1·4 patients and at the latter one to 1·9 patients. In addition to their fever and small-pox hospital accommodation the managers now possess asylums and schools for 6097 imbeciles as well as the control of the training ship *Exmouth*.

In our next notice we propose to deal with the "Medical Supplement" of the report.

Public Health and Poor Law.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Stirling County District.—Dr. J. C. McVail has embodied in his current annual report an interesting and instructive paper on dairy sanitation, a paper which comes very opportunely with the recently published report of the Royal Commission on the Control of Tuberculosis. After setting forth succinctly the fundamental principles governing the prevalence of bovine tuberculosis he points out that the real question at issue is by what means the temperature of the byre is to be kept at about 60° F. (the temperature most conducive to a full flow of milk from a cow) and at the same time to prevent the air from becoming impure. This condition can, he observes, be satisfactorily procured only by means of artificial heating, and he proceeds to discuss how this may best be carried out. To apply to the case of cows the standard which in man necessitates 3000 cubic feet of air per hour is clearly impracticable, and it is estimated that even if the space per cow were as much as 1000 cubic feet the air would need to be changed no less than 16 times per hour, a state of affairs which would not be pleasant in practice. Coming, then, to what is practicable, Dr. McVail furnishes some diagrams prepared by Mr. James Chalmers showing how existing byres may be heated. In one instance in the case of an existing byre it is proposed to lay hot-water pipes beneath the cow's manger, the fresh heated air being admitted by a series of Tobin's tubes, there being also in a well-arranged place some means for extracting foul air through the roof. The cost of carrying out this proposal for a byre of 20 cows is estimated at about £40 and the cost of fuel for six months at about 12*s.* per cow. The heating of new byres is, as Dr. McVail remarks, a comparatively simple matter, as they can easily be constructed with a due regard to the necessities of the apparatus. The cows could be arranged to stand either face-to-face or tail-to-tail with, of course, a proper interval between them. Dr. McVail, while describing the methods of artificial heating, is careful to insist upon the fact that even without this much good may be done by adequate ventilation and proper lighting, and he urges on his readers the paramount importance of the greatest cleanliness in all operations connected with the drawing, storage, and sale of milk. The paper was written before the report of the Royal Commission was issued, but the advent of the report does but accentuate the value of the paper, inasmuch as it develops in detail some of the Commissioner's recommendations.

St. Olave's (Southwark) Sanitary District.—There is a large trade hereabouts in hides and skins and during 1897 Dr. W. A. Bond, the medical officer of health, was informed of 7 cases of anthrax which were admitted into Guy's Hospital; there was also a case of a somewhat doubtful nature. After

operation all the patients but one recovered. Of 11 cases of enteric fever notified in this district during 1897 one was attributed to the consumption of oysters at Southend.

Maidstone Urban Sanitary District.—The remarkable epidemic of enteric fever which occurred recently in this district seems to be passing away into history and yet the Local Government Board report of the public inquiry which was held into its origin has not yet been issued. It is to be regretted that it should be thus delayed. In his current annual report Mr. M. A. Adams, the medical officer of health of Maidstone, refers but briefly to the subject and we can well understand why this should be so. He gave most valuable assistance to the three inspectors who held the inquiry and doubtless a full account of his evidence will be forthcoming in their joint report. Mr. Adams tells us that in this outburst, which will probably figure in most works on hygiene as an instructive instance of water-borne enteric fever, there were 1888 cases notified, 859 of these being referred to East Maidstone and 1029 to West Maidstone. The fatality-rate in the former district was 5·93 per cent. and in the latter 7·68 per cent. There was a large number of deaths from diarrhœa at a time just antecedent to the outbreak and Mr. Adams regards these cases as having arisen from causes other than those to which autumnal diarrhœa is usually attributed.

Poplar Sanitary District.—A watercress-bed in this district has recently been receiving attention at the hands of Mr. R. M. Talbot, who after demonstrating that water taken therefrom was contaminated with sewage succeeded in persuading the owner to close the bed. In the consumption of watercress we have not, as Mr. Talbot observes, the protection which in the cases of many articles of food is afforded by boiling.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In thirty-three of the largest English towns 5742 births and 3932 deaths were registered during the week ending Aug. 6th. The annual rate of mortality in these towns, which had increased in the three preceding weeks from 14·7 to 17·2 per 1000, further rose last week to 18·3. In London the rate was 18·4 per 1000, while it averaged 18·2 in the thirty-two provincial towns. The lowest death-rates in these towns were 10·2 in Brighton and in Huddersfield, 10·9 in Oldham, 11·9 in Burnley, and 12·0 in Hull; the highest rates were 23·9 in Sunderland, 24·2 in Plymouth, 24·4 in Liverpool, and 25·6 in Salford. The 3932 deaths in these towns included 794 which were referred to the principal zymotic diseases, against 487 and 572 in the two preceding weeks; of these, 574 resulted from diarrhœa, 71 from whooping-cough, 52 from diphtheria, 45 from measles, 29 from "fever" (principally enteric), and 23 from scarlet fever. No fatal case of any of these diseases occurred last week in Brighton, Burnley, or Huddersfield; in the other towns they caused the lowest death-rates in Halifax, Swansea, and Gateshead, and the highest rates in Portsmouth, Liverpool, Sheffield, and Plymouth. The greatest mortality from measles and from scarlet fever occurred in Plymouth; from whooping-cough in Sunderland and in Preston; and from diarrhœa in Portsmouth, Birmingham, Leicester, Liverpool, Salford, and Sheffield. The mortality from "fever" showed no marked excess in any of the large towns. The 52 deaths from diphtheria included 30 in London, 6 in Leeds, 5 in Birmingham, and 4 in West Ham. No fatal case of small-pox was registered last week in any of the thirty-three large towns; and only one small-pox patient was under treatment in the Metropolitan Asylums Hospitals. The number of scarlet fever patients in these hospitals and in the London Fever Hospital on Saturday last, the 6th inst., was 2326, against 2314, 2355 and 2321, at the end of the three preceding weeks; 224 new cases were admitted during the week, against 265, 276, and 232, in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 148 and 173 in the two preceding weeks, further rose to 174 last week, but were 7 below the corrected average. The causes of 55, or 1·4 per cent., of the deaths in the thirty-three towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in West Ham, Nottingham, Leeds, Hull, and in twelve other smaller towns; the largest proportions of uncertified deaths were registered in Birmingham, Liverpool, Blackburn, and Sunderland.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 20·1 and 18·6 per 1000 in the two preceding weeks, rose again to 20·0 during the week ending August 6th, and exceeded by 1·7 per 1000 the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 16·4 in Leith and 16·7 in Dundee to 30·0 in Paisley and 34·0 in Greenock. The 604 deaths in these towns included 77 which were referred to diarrhœa, 30 to whooping-cough, 20 to measles, 4 to scarlet fever, 2 to diphtheria, and 1 to "fever." In all, 134 deaths resulted from these principal zymotic diseases, against 118 and 113 in the two preceding weeks. These 134 deaths were equal to an annual rate of 4·4 per 1000, which was 0·7 above the mean rate last week from the same diseases in the thirty-three large English towns. The 77 fatal cases of diarrhœa showed a further increase upon the numbers recorded in recent weeks and included 45 in Glasgow, 7 in Paisley, and 6 in Dundee. The deaths referred to whooping-cough, which had been 29 and 20 in the two preceding weeks, rose again to 30 last week, of which 16 occurred in Glasgow, 5 in Edinburgh, and 5 in Aberdeen. The fatal cases of measles, which had been 19 and 25 in the two preceding weeks, declined again to 20 last week, of which 7 were recorded in Dundee, 5 in Glasgow, and 5 in Edinburgh. The 4 deaths from scarlet fever showed a further decline from recent weekly numbers and included 2 in Greenock. The 2 fatal cases of diphtheria occurred in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had been 75 and 79 in the two preceding weeks, were again 79 last week, and slightly exceeded the number in the corresponding period of last year. The causes of 25, or more than 4 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had increased in the three preceding weeks from 18·5 to 23·9 per 1000, was again 23·9 during the week ending Aug. 6th. During the past four weeks the rate of mortality in the city has averaged 22·3 per 1000, the rate during the same period being 16·2 in London and 19·1 in Edinburgh. The 160 deaths registered in Dublin last week corresponded with the number in the preceding week, and included 27 which resulted from the principal zymotic diseases, against 12 and 14 in the two preceding weeks; of these, 18 were referred to diarrhœa, 5 to "fever," 2 to diphtheria, 1 to scarlet fever, but not one either to small-pox, or measles. These 27 deaths were equal to an annual rate of 4·0 per 1000, the zymotic death-rate during the same period being 3·7 in London and 2·8 in Edinburgh. The fatal cases of diarrhœa, which had been 4 and 9 in the two preceding weeks, further rose to 18 last week. The deaths referred to different forms of "fever" which had been 1 and 3 in the two preceding weeks, further rose to 5 last week. The mortality from scarlet fever and from diphtheria corresponded with that recorded in the preceding week. The 160 deaths in Dublin last week included 46 of infants under one year of age, and 31 of persons aged upwards of sixty years; the deaths of infants showed a marked increase, while those of elderly persons showed a decline upon the number in the preceding week. Two inquest cases and 2 deaths from violence were registered; and 55, or more than a third, of the deaths occurred in public institutions. The causes of 11, or nearly 7 per cent., of the deaths in the city last week were not certified.

VITAL STATISTICS OF LONDON DURING JULY, 1898.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality during July in each of the forty-three sanitary areas of London. With regard to the notified cases of infectious diseases in the metropolis last month, it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to 8·1 per 1000 of the population, estimated at 4,504,768 persons in the middle of this year. In the three preceding months the rates had been 7·1, 7·2, and 7·1 per 1000 respectively. Among the various sanitary

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JULY, 1898.

(Specially compiled for THE LANCET.)

Sanitary Areas.	Estimated population in the middle of 1898.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.										Deaths from all causes.	Death-rate per 1000 living.	Deaths of infants under one year to 1000 births.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.*	Puerperal fever.	Erysipelas.	Cholera.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.†	Whooping-cough.	Typhus fever.	Enteric fever.	Other continued fevers.	Diarrhœa.	Total.	Annual rate per 1000 persons living.			
LONDON...	4,504,766	2	1372	911	—	154	6	17	342	2	2806	8·1	—	96	31	115	150	—	25	—	281	698	2.0	5083	14·7	143
West Districts.																										
Paddington	127,480	—	29	24	—	3	—	2	5	—	63	6·4	—	2	1	8	3	—	—	—	1	15	1·5	115	11·8	95
Kensington	172,174	—	51	9	—	3	—	—	10	—	73	5·5	—	2	1	—	9	—	1	—	12	25	1·9	193	14·6	208
Hammersmith	107,370	—	45	14	—	3	—	—	12	—	74	9·0	—	2	1	4	4	—	—	—	7	18	2·2	114	13·8	148
Fulham	125,275	—	61	47	—	3	—	2	7	—	120	12·5	—	2	—	3	4	—	1	—	16	26	2·7	165	17·2	210
Chelsea	96,713	—	35	27	—	4	—	2	9	—	77	10·4	—	—	1	3	4	—	1	—	5	14	1·9	94	12·7	169
St. George Hanover-square	80,608	—	36	8	—	2	—	—	4	—	50	8·1	—	1	—	—	1	—	—	—	3	5	0·8	69	11·2	70
Westminster	52,574	—	8	6	—	4	—	—	5	—	23	5·7	—	—	—	3	1	—	—	—	2	6	1·5	81	20·1	198
St. James Westminster	22,200	—	3	8	—	—	—	—	1	—	12	7·0	—	—	—	1	1	—	—	—	2	4	2·3	35	20·6	200
North Districts.																										
Marylebone	140,483	—	42	18	—	9	1	1	11	—	82	7·6	—	3	1	2	2	—	2	—	7	17	1·6	161	14·9	131
Hampstead	78,755	—	13	10	—	6	—	—	5	—	34	5·6	—	—	—	1	—	—	—	—	—	1	0·2	47	7·8	36
St. Pancras	243,416	—	94	30	—	11	—	3	22	—	160	8·6	—	4	5	3	10	—	1	—	18	41	2·2	226	15·3	160
Islington	344,616	—	93	40	—	13	—	—	17	—	163	6·2	—	7	—	1	9	—	3	—	8	28	1·1	315	11·9	104
Stoke Newington	34,660	—	12	4	—	—	—	—	1	—	17	6·4	—	—	—	—	—	—	—	—	2	2	0·8	34	12·8	38
Hackney	219,630	—	72	40	—	15	—	—	26	—	153	9·1	—	4	2	6	4	—	1	—	19	36	2·1	225	13·4	128
Central Districts.																										
St. Giles	37,519	—	2	4	—	2	—	—	5	—	13	4·5	—	—	—	1	1	—	—	—	—	2	0·7	52	18·1	132
St. Martin-in-the-Fields	12,424	—	1	1	—	1	—	—	1	—	4	4·2	—	—	—	1	1	—	—	—	—	2	2·1	14	14·7	63
Strand	23,284	—	3	2	—	—	—	—	1	—	6	3·4	—	—	—	1	1	—	—	—	—	2	1·1	36	20·2	135
Holborn	30,056	—	6	6	—	—	—	—	3	—	15	6·5	—	1	1	—	—	—	—	—	1	3	1·3	41	17·8	216
Clerkenwell	66,120	—	15	26	—	4	1	—	6	—	62	12·2	—	5	1	8	3	—	—	—	4	21	4·1	100	19·7	163
St. Luke	41,076	—	13	18	—	—	—	—	1	—	32	10·2	—	—	—	4	1	—	—	—	6	11	3·5	56	17·6	89
City of London	29,068	—	8	4	—	—	—	—	2	—	14	6·3	—	1	—	—	—	—	—	—	1	2	0·9	35	15·7	100
East Districts.																										
Shoreditch	121,485	—	17	13	—	3	—	—	10	—	43	4·6	—	2	—	5	2	—	—	—	19	28	3·0	181	19·4	190
Bethnal Green	129,027	—	32	21	—	3	—	—	12	—	68	6·9	—	5	—	—	2	—	1	—	7	15	1·5	135	13·6	132
Whitechapel	80,569	—	26	23	—	2	—	—	8	—	59	9·5	—	5	1	3	1	—	1	—	7	18	2·9	113	18·3	147
St. George-in-the-East	48,241	—	9	13	—	3	—	—	6	—	31	8·4	—	1	—	2	1	—	—	—	9	13	3·5	78	21·1	215
Limehouse	58,661	—	19	8	—	2	—	—	5	—	34	7·6	—	4	1	1	5	—	—	—	4	15	3·3	104	23·1	204
Mile End Old Town	112,528	—	36	26	—	4	—	—	7	—	73	8·5	—	3	—	2	3	—	1	—	13	22	2·5	144	16·7	176
Poplar	170,220	—	49	60	—	9	—	1	15	—	134	10·3	—	9	1	11	4	—	2	—	16	43	3·3	236	18·1	184
South Districts.																										
St. Saviour Southwark	24,562	—	9	7	—	2	—	—	5	—	23	12·2	—	—	1	1	1	—	—	—	—	3	1·6	26	19·1	131
St. George Southwark	60,466	—	37	15	—	1	—	1	6	—	60	12·9	—	1	2	2	4	—	1	—	4	14	3·0	98	21·1	224
Newington	123,183	—	62	40	—	2	1	1	9	—	115	12·2	—	—	5	2	5	—	1	—	15	28	3·0	163	17·2	177
St. Olave Southwark	11,288	—	12	2	—	—	—	—	3	—	17	19·6	—	—	—	1	1	—	—	—	—	2	2·3	21	24·2	43
Bermondsey	85,738	—	53	12	—	3	—	1	9	—	78	11·9	—	5	—	—	6	—	1	—	6	18	2·7	106	16·1	106
Rotherhithe	40,849	—	8	2	—	1	—	—	11	—	22	7·0	—	3	1	1	1	—	—	—	1	7	2·2	47	15·0	129
Lambeth	304,073	—	77	81	—	8	—	1	13	2	182	7·8	—	6	—	13	18	—	—	—	23	60	2·6	340	14·6	140
Battersea	171,921	—	44	56	—	7	—	—	12	—	119	9·0	—	1	1	2	7	—	1	—	16	28	2·1	198	14·9	191
Wandsworth	202,526	—	54	46	—	6	—	—	12	—	118	7·6	—	2	1	3	7	—	1	—	5	26	1·7	178	11·5	98
Camberwell	261,189	2	86	49	—	3	2	—	10	—	152	7·6	—	—	1	5	7	—	—	—	4	17	0·8	233	11·6	107
Greenwich	180,441	—	41	33	—	8	—	1	21	—	104	7·5	—	4	1	5	8	—	1	—	7	26	1·9	186	13·4	121
Lewisham (excluding Penge)	88,562	—	10	33	—	1	—	—	2	—	46	6·8	—	1	—	4	2	—	—	—	13	20	1·9	82	12·1	117
Woolwich...	41,478	—	7	3	—	—	—	—	2	—	12	3·8	—	—	—	1	2	—	1	—	1	5	1·6	35	11·0	129
Lee	39,717	—	9	8	—	1	—	—	5	—	23	7·5	—	—	—	1	1	—	3	—	3	8	2·6	47	15·4	149
Plumstead	62,531	—	32	4	—	1	1	1	5	—	44	9·2	—	3	1	—	3	—	—	—	1	8	1·7	56	11·7	101
Port of London	—	—	1	—	—	1	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including 14 cases of membranous croup.

† Including deaths from membranous croup.

areas the rates were considerably below the average in Kensington, Hampstead, St. Giles, St. Martin-in-the-Fields, Strand, Shoreditch, and Woolwich; while they showed the largest excess in Fulham, Clerkenwell, St. Saviour Southwark, St. George Southwark, Newington, St. Olave Southwark, and Bermondsey. Two cases of small-pox were notified in London during July, against 4, 1, and 6 in the three preceding months; these 2 cases occurred in Camberwell sanitary area. No small-pox patients were under treatment during the month in any of the Metropolitan Asylums Hospitals. The prevalence of scarlet fever in London during July showed a marked increase upon that recorded in the preceding month; among the various sanitary areas this disease showed the highest proportional prevalence in Fulham, St. George Hanover-square, St. Pancras, St. George Southwark, Newington, St. Olave Southwark, Bermondsey, and Plumstead. The Metropolitan Asylums Hospitals contained 2255 scarlet fever patients at the end of July, against 2270, 2147, and 2146 at the end of the three preceding months; the weekly admissions averaged 242, against 218, 223, and 208 in the three preceding months. The prevalence of diphtheria in London during July showed a slight further increase upon that recorded in recent months; this disease was proportionally most prevalent in Fulham, St. James Westminster, Clerkenwell, St. Luke, Poplar, Newington, Battersea, and Lewisham sanitary areas. There were 1014 diphtheria patients under treatment in the Metropolitan Asylums Hospitals at the end of July, against 923, 917, and 971 at the end of the three preceding months; the weekly admissions averaged 146, against 134 in each of the two preceding months. The prevalence of enteric fever in London showed a marked further increase upon that recorded in the two preceding months; among the various sanitary areas this disease showed the highest proportional prevalence in Westminster, Hampstead, Hackney, and St. Saviour Southwark. The Metropolitan Asylums Hospitals contained 87 enteric fever patients at the end of July, against 59, 54, and 53 at the end of the three preceding months; the weekly admissions averaged 16, against 8 and 11 in the two preceding months. Erysipelas was proportionally most prevalent in Hackney, St. Giles, St. Olave Southwark, Rotherhithe, and Greenwich sanitary areas. The 17 cases of puerperal fever notified in London during July included 3 in St. Pancras, 2 in Paddington, 2 in Fulham, and 2 in Chelsea sanitary areas.

The mortality statistics in the table relate to the deaths of persons actually belonging to the various sanitary areas of the metropolis, the deaths occurring in the institutions of London having been distributed among the various sanitary areas in which the patients had previously resided. During the four weeks ending Saturday, July 30th, the deaths of 5083 persons belonging to London were registered, equal to an annual rate of 14·7 per 1000, against 18·1, 15·7, and 14·6 in the three preceding months. The lowest death-rates in the various sanitary areas were 7·8 in Hampstead, 11·0 in Woolwich, 11·2 in St. George Hanover-square, 11·5 in Wandsworth, 11·6 in Camberwell, 11·7 in Plumstead, and 11·8 in Paddington; the highest rates were 20·1 in Westminster, 20·2 in Strand, 20·6 in St. James Westminster, 21·1 in St. George-in-the-East and in St. George Southwark, 23·1 in Limehouse, and 24·2 in St. Olave Southwark. During the four weeks of July 698 deaths were referred to the principal zymotic diseases in London; of these, 281 resulted from diarrhœa, 150 from whooping-cough, 115 from diphtheria, 96 from measles, 31 from scarlet fever, 25 from enteric fever, and not one either from small-pox, typhus, or any ill-defined form of continued fever. These 698 deaths were equal to an annual rate of 2·0 per 1000; among the various sanitary areas the lowest zymotic death-rates were recorded in St. George Hanover-square, Hampstead, Stoke Newington, St. Giles, City of London, and Camberwell; and the highest rates in Clerkenwell, St. Luke, Shoreditch, St. George-in-the-East, Limehouse, Poplar, St. George Southwark, and Newington. The 281 fatal cases of diarrhœa were as many as 505 below the corrected average number in the corresponding periods of the ten preceding years; this disease showed the highest proportional fatality in Fulham, St. Luke, Shoreditch, St. George-in-the-East, and Newington sanitary areas. The 150 deaths referred to whooping-cough were 13 below the corrected average number; among the various sanitary areas this disease was proportionally most fatal in Kensington, Clerkenwell, Limehouse, St. George Southwark, Bermondsey, and Lambeth. The 115 fatal cases of diphtheria were 42 below the corrected average number; this disease showed the highest proportional fatality in Paddington, Westminster, Clerkenwell, St. Luke, Shoreditch, Poplar, Lambeth, and Lewisham sanitary areas. The 96 deaths from measles were 131 below the corrected average number; among the various sanitary areas the mortality from this disease was highest in Clerkenwell, Whitechapel, Limehouse, Poplar, Bermondsey, and Rotherhithe. The 31 fatal cases of scarlet-fever were less than half the corrected average number; the mortality from this disease showed no marked excess in any of the sanitary areas. The 25 deaths referred to enteric fever were 9 below the corrected average number; among the various sanitary areas this disease showed the highest proportional fatality in Lee. In conclusion, it may be stated that the aggregate mortality last month from these principal zymotic diseases was less than half the average, the deaths from each of the diseases being below the average.

Infant mortality in London, measured by the proportion of deaths of children under one year of age to registered births, was equal to 143 per 1000, and was considerably below the average. Among the various sanitary areas the lowest rates of infant mortality were recorded in St. George Hanover-square, Hampstead, Stoke Newington, St. Martin-in-the-Fields, St. Luke, and St. Olave Southwark; and the highest rates in Kensington, Fulham, Holborn, St. George-in-the-East, Limehouse, and St. George Southwark.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are announced:—Fleet-Surgeon Edward W. Luther to the *Thunderer*, additional for Pembroke Dockyard. Staff-Surgeon William M. Lory to the *Repulse*. Surgeon W. L. Martin to the *Vivid*.

ROYAL ARMY MEDICAL CORPS.

Colonel William A. Catherwood, to be Surgeon-General, vice J. W. Maxham, retired. The under-mentioned Captains to be Majors:—John S. Davidson, James Will, James Moir, James Fallon, John V. Salvage, Arthur R. Aldridge, Joseph Fayrer, Charles P. Walker, Charles J. MacDonald, Charles J. W. Tatham, Thomas H. T. Clarkson, Herbert W. Austin, Cathcart Garner, Robert W. Wright, Edwin Eckersley, Reginald J. C. Cottell, James R. Burrows, John Keatly, Daniel Hennessy, David M. Saunders, William Kiddle, Dennis M. O'Callaghan, Michael J. Whitty, Henry A. Cummins, James F. Donegan, John Donaldson, Hugh B. Mathias, George Bent, George H. Barefoot, Foster R. Newland, Reginald J. Windle, Robert J. D. Hall, Edward S. Marder, Charles W. Allport, John J. Russell, John S. Edye, George Scott, Thomas Browning, Andrew Hosie, George F. H. Marks, Ralph Holyoake, Robert N. Buist, John J. C. Watson, Thomas Du B. Whaite, Henry T. Knaggs, and Ferdinand S. Le Quesne, V.C. The following Lieutenants to be Captains: Lionel Fergus Smith, Robert J. Blackham, Septimus H. Fairrie, George T. K. Maurice, Rupert Fawssett, John V. Forrest, Henry W. Grattan, Francis E. Gunter, John H. Campbell, and John Grech. The under-mentioned surgeons on probation to be Lieutenants: William Henry Snyder Nickerson, George Snyder Nickerson, George Bedford Crisp, Robert Strickland Hannay Fuhr, Walter Jagger, Alexander Bremner MacCarthy, George Johnston Stoney Archer, Robert Selby, Sydney Octavius Hall, Alfred Edmond Weld, James Stuart Gallie, Francis Joseph Christopher Heffernan, Arthur Edward Thorp, Cecil Wilmot Mainprise, Henry Herrick, Edwin John Dobbin, James Cowan, Austin Romuald O'Flaherty, Henry Beckles Gall Walton, and Edmund Philip Hewitt.

INDIA AND THE INDIAN MEDICAL SERVICES.

The services of Surgeon-Captain Thomson (Bombay) are replaced at the disposal of the military department. The services of Surgeon-Lieutenant-Colonel Macdonald (Bengal), Senior Medical Officer, Port Blair, are placed temporarily at the disposal of the military department. Surgeon-Major Hudson (Bengal) is appointed to officiate as Senior Medical Officer, Port Blair. The services of Surgeon-Captain Hall (Bengal) are placed temporarily at the disposal of the Chief Commissioner of Assam. The services of Surgeon-Captain Williams (Bengal) are replaced at the disposal of the Government of Burmah. Surgeon-Captain Moir, First Resident Surgeon, Presidency General Hospital, Calcutta, is allowed furlough for one year.

Surgeon-Captain O'Kinealy, Second Resident Surgeon, Presidency General Hospital, Calcutta, is appointed to act as First Resident Surgeon of that institution during the absence on leave of Surgeon-Captain Moir, or until further orders. Surgeon-Captain Oldham, Civil Surgeon of Backergunge, is appointed to act as Second Resident Surgeon, Presidency General Hospital, Calcutta, or until further orders. Surgeon-Lieutenant Sealy has been appointed Chief Medical Officer, Railway Inspection duty, Kalyan. Surgeon-Lieutenant-Colonel F. Street, D.S.O., and Surgeon-Captain J. B. Smith have respectively delivered over and received charge of the office of the Deputy Sanitary Commissioner, Central Registration District. To be Surgeon-Colonel: Brigade-Surgeon-Lieutenant-Colonel Arthur Mudge Branfoot, Madras Establishment. To be Brigade-Surgeon-Lieutenant-Colonel: Surgeon-Lieutenant-Colonel Arthur Henry Cole Dane, M.D., Bombay Establishment.

VOLUNTEER CORPS.

Artillery: 1st Norfolk (Eastern Division, Royal Artillery): Surgeon-Lieutenant H. M. Evans to be Surgeon-Captain. *Rifle:* 2nd Volunteer Battalion the Northumberland Fusiliers: Surgeon-Major H. F. Hurst to be Surgeon-Lieutenant-Colonel. 1st Volunteer Battalion the Worcestershire Regiment: Surgeon-Captain A. R. Waddell resigns his commission. 1st Wiltshire: Brigade-Surgeon-Lieutenant-Colonel F. F. Lee resigns his commission; also is permitted to retain his rank and to continue to wear the uniform of the corps on his retirement, vacating at the same time the appointment of Senior Medical Officer to the Western Counties Volunteer Infantry Brigade. 9th Lanarkshire: Surgeon-Lieutenant-Colonel J. Lindsay resigns his commission; also is permitted to retain his rank and to continue to wear the uniform of the corps on his retirement.

VOLUNTEER OFFICERS' DECORATION.

The Queen has conferred the Volunteer Officers' Decoration upon the undermentioned officers of the Volunteer Force: *North-Eastern District: Rifle:* 2nd Volunteer Battalion the Durham Light Infantry: Surgeon-Lieutenant-Colonel Thomas Alexander McCullagh. *North-Western District: Rifle:* 2nd Volunteer Battalion the Lancashire Fusiliers: Surgeon-Lieutenant-Colonel Charles William Thorp. 2nd (Earl of Chester's) Volunteer Battalion the Cheshire Regiment: Surgeon-Lieutenant-Colonel Alexander Hamilton. 6th Volunteer Battalion the Manchester Regiment: Surgeon-Lieutenant-Colonel Thomas Fort. 1st Volunteer Battalion the Prince of Wales's (North Staffordshire Regiment): Surgeon-Lieutenant-Colonel James Charlesworth. *Scottish District: Artillery:* 1st Aberdeenshire Volunteer Artillery: Surgeon-Major Robert John Garden. *Rifle:* 3rd Lanarkshire Volunteer Rifle Corps: Surgeon-Lieutenant-Colonel Alexander Napier. 2nd Volunteer Battalion the Gordon Highlanders: Surgeon-Major Sir James Reid, Bart., K.C.B. 2nd (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders): Surgeon-Lieutenant-Colonel William Goldie Stevens and Surgeon-Lieutenant-Colonel Matthew Hamilton Taylor. *Southern District: Artillery:* 2nd Hampshire Volunteer Artillery (Southern Division, Royal Artillery): Surgeon-Lieutenant-Colonel Gordon Sparrow. *South-Eastern District: Rifle:* 2nd Volunteer Battalion the Royal Sussex Regiment: Surgeon-Lieutenant Adolphus W. W. Caudle, retired. *Western District: Rifle:* 1st (Brecknockshire) Volunteer Battalion the South Wales Borderers: Acting Surgeon Talfourd Jones, retired.

THE FOOT-GEAR OF INFANTRY SOLDIERS.

This important subject continues to excite attention among continental military and naval hygienists. In the course of a general report on his charge, Surgeon-Major Prat of the 1st Regiment of Marines, at present quartered at Cherbourg, devotes considerable space to a disquisition on the soldier's boot in ancient and modern times, showing conclusively by examples from Xenophon downwards how largely the fate of armies depends on their mobility and how entirely this depends upon an effective foot-gear. If his best is required of him a foot-soldier should be provided not only with a pair of boots which have been made to fit his individual foot, which are impermeable to dust and moisture though not to air, and which are constructed of the best and most durable material known to science tempered by experience, but also with a comfortable pair of shoes, likewise constructed from the best material, for him to rest his tired feet in at the end of the day's march. This principle is fully recognised and acted upon in the German and Austrian armies, but apparently the French Ministry of War has not yet gone beyond the stage of experiment. The boot of the French *fantassin*, according to the latest pattern, has no strap and is double soled, the inner sole being three millimetres thick and the outer four. In length the boot varies from 26 to 33 centimetres, and it is made in no fewer than 32 sizes. The reporter likewise reviews the question of socks, which it seems do not form part of the *fantassin's* regulation kit, although generally worn at his own expense. Viry in his *Principes d'Hygiène Militaire* recommends the "Russian sock," which consists of a cloth band wound round the foot and ankle, but unless very skilfully applied it is apt to ruck up and form creases. On the whole a woven or knitted sock is far preferable, provided its fit is accurate. In the English army, we are told, after an exhaustive trial unsewn or seamless socks were served out to the infantry, but for some unexplained reason the next issue was reduced by one-half to make way for socks with seams. Surgeon-Major Prat concludes this portion of his report with a very accurate description of an English pedestrian's running shoe of which he highly approves. In this connexion the following short extract from a paper on Naval Hygiene, by Principal Medical Officer Dr. Danguy des Desert, in the *Archives de Médecine Navale* for July may be worth quoting: "The sailor's footgear leaves much to be desired; the shape could not possibly be more unsightly or the construction more defective. The sewing is so coarse that it injures the foot, and the ends are so pointed that there is no room for the toes. It is made in four sizes only. Without asking for eight different lengths, with four separate sizes to each length, as in the English navy, I think our sailors may reasonably claim a better made boot, less weighty and not so clumsy. The article which they now receive is so heavy and so cumbersome that the men are for ever injuring themselves by slipping down the iron gangways, and whenever they can, even in the coldest weather, they prefer to go barefoot."

BRIGADE-SURGEON-LIEUTENANT COLONEL D. D. CUNNINGHAM, F.R.S., C.I.E.

The retirement of this officer has led the Government of India in the Home Department to address a very handsome and highly appreciatory letter to the Director-General of the Indian Medical Service in regard to the very eminent scientific services rendered by Brigade-Surgeon-Lieutenant Colonel Cunningham to the State. After setting forth a history of the valuable work performed by this officer over a number of years as Professor of Physiology at the Medical College, Calcutta, and as Special Assistant to the Sanitary Commission with the Government of India, together with a list of his various published researches and reports, some of which were in collaboration with the late Dr. Timothy Lewis, the Government of India finally add: "By the retirement of Dr. Cunningham the Government of India lose the services of one of the most distinguished of the scientific men who have served them, the Indian Medical Service one of its most eminent members, and yourself an invaluable adviser. He carries with him on his retirement the warmest thanks of the Government of India for his long and distinguished services." We may add that Brigade-Surgeon-Lieutenant-Colonel D. D. Cunningham has the reputation of being one of the most able, conscientious, and laborious workers not only in India but in the medical profession, and many of his scientific researches are of a very original kind and based upon honest and independent inquiry.

DEATHS IN THE SERVICES.

Surgeon William Godfrey Peck, R.N., at Malta, on July 28th. He received his appointment as Surgeon in November, 1894.

Fleet-Surgeon Charles Albert Macaulay, at Wei-Hai-Wei, China. He entered the Royal Navy in 1875, was promoted to Staff-Surgeon in 1887, and made Fleet-Surgeon in 1896. He served as Surgeon of the *Alexandra* at the bombardment of Alexandria in 1882; landed with the Naval Brigade at Alexandria, and was also at the seizure of Port Said. He was with the Naval Brigade at Ismailia, and was present at Tel-el-Kebir and subsequent advance to Zagazig (Egyptian medal, Alexandria and Tel-el-Kebir clasps, Khedive's bronze star, and the Fourth Class of the Order of the Medjidie).

Surgeon-General John Fullarton Beatson, C.I.E. (late

Bengal Army), on the 29th ult., at his residence in London, aged eighty-two years.

Inspector-General of Hospitals John Murray, at Sheringham, Norfolk.

OUR INDIAN FRONTIER.

The latest news received at Simla regarding our Indian frontier is not altogether satisfactory. It points to possible future troubles in this direction and in the Tochi valley. There has been some fighting among the tribesmen and their chiefs. The Afridis are quiet as far as the Indian Government is concerned but are quarrelling among themselves.

THE ROYAL ARMY MEDICAL CORPS FOR INDIA.

The *Pioneer Mail* of the 22nd ult. states that in consequence of the publication in this country of the new warrant reconstituting the Army Medical Service the Indian Government have been asked to submit proposals in regard to the Indian Medical Service. This is only what might have been anticipated.

THE SOUDAN CAMPAIGN.

The Anglo-Egyptian Expeditionary force will soon be starting for Khartoum. The troops are in good health and fettle and all the necessary preparations for the campaign have been made.

Correspondence.

"Audi alteram partem."

THE BATTLE OF THE CLUBS.

To the Editors of THE LANCET.

SIRS,—Mr. Cecil Aloysius Corke of Wem, Salop, has been elected surgeon to the Court Vale of Evesham, No. 4648, of the Ancient Order of Foresters in lieu of my partner and myself who resigned, as you are aware, in consequence of our salary being reduced after twenty-five years. Six other medical men, so I am informed, made inquiries, but finding how we had been treated refused to have anything to do with a society which had behaved to us in such a manner.

I am, Sirs, yours faithfully,

Evesham, July 31st, 1898. A. H. MARTIN.

*** There is no law, written or unwritten, to prevent Mr. Corke from putting his own value on his services. Perhaps Mr. Corke did not know the circumstances under which the vacancy occurred.—ED. L.

"PIPERIDINE AS A URIC ACID SOLVENT."

To the Editors of THE LANCET.

SIRS,—We say in the conclusions which terminate our article in THE LANCET of July 23rd that the dose of piperidine tartrate is 15 gr. three times a day. We think it wiser, however, to state that we have for the most part employed it in 10 gr. doses as stated earlier in our paper and should suggest this as a dose for the commencement of treatment.

We have read with interest Dr. Luff's letter on "The Treatment of Gout by Piperidine" in THE LANCET of July 30th. We are afraid, however, that the differences between us, both with regard to technique and results, are too extensive to be adequately treated in letter form. We are perfectly acquainted with Dr. Luff's paper in THE LANCET of June 11th. It was not mentioned in our paper because although the latter only appeared on July 23rd it left our hands at the end of April. This later paper of Dr. Luff will be considered fully elsewhere.

We are unable to follow Dr. Luff's calculations. In THE LANCET of June 11th he says that in order to have a 0·1 per cent. solution of any drug in the blood 600 grains must be introduced into the circulation at once. If the figures in his letter of July 30th be calculated back it will be seen that he now says that 750 grains are necessary to produce this result. For our part the one statement is as extraordinary as the other. The blood in a man of average weight weighs about 5 kilos.[1]; if 750 grains, that is, 50 grms., of any drug be introduced into the circulation at once the blood must contain 1 per cent. of it, not 0·1 per cent.; if 600 grains were introduced the amount would be 0·8 per cent.—that is, about ten times the figure given by Dr. Luff. We made experiments with standard solvent exactly similar to the ones described, adding amounts of the respective drugs down to 0·01 per cent. In each case we found that the drug exerted a solvent action directly proportional to the results given in our table on p. 202 of THE LANCET of July 23rd, as also was the case in urine for uric acid and urinary sediments (pp. 200 and 201). When worked out this amounts to the fact that piperidine in 0·01 per cent. solution increases the solvent power of standard solvent for sodium biurate one and a half times.

With regard to the question of uric acid in bullock's serum. We maintain that our experiments show that this substance is contained in bullock's serum to the extent of 0·00029 per cent.; the manipulations to which we submitted the serum constituted not only a quantitative but a qualitative test for uric acid and rendered the murexide test unnecessary. The use of the murexide test would have cost us a certain quantity of serum and has already been applied with a positive result by Abeles. We are quite aware of the work of von Jaksch, Klemperer, and Sir Alfred Garrod. The consensus of opinion seems to us to be that there is uric acid in very small quantities in the blood of man and animals under normal conditions. This is stated in the following text-books: Neumeister,[2] Hammarsten,[3] and Schäfer,[4] in addition to those mentioned in our original article.

We are, Sirs, yours faithfully,

F. W. TUNNICLIFFE.

Devonshire-street, W., Aug. 3rd, 1898. OTTO ROSENHEIM.

[1] Schäfer: Textbook of Physiology, p. 142.

[2] Lehrbuch der Physiologischen Chemie, 1897, p. 587.

[3] Ibid., 1895, p. 425.

[4] Text-book of Physiology, page 160.

"THE RECTAL INJECTION OF THE SERUMS."

To the Editors of THE LANCET.

SIRS,—In THE LANCET of July 30th, p. 279, a letter by Dr. J. E. O'Connor draws attention to the value of rectal injections in serum therapeutics, a plan evidently supposed to be original. A reference to the *Medical Digest and Appendix*, Section 886, 4, will enable those interested to obtain a large amount of information upon the subject, and in THE LANCET of Feb. 8th, 1896, p. 389, and of March 7th, 1896, p. 641, a paper published since the last issue of the *Medical Digest* enters fully into the subject.

I am, Sirs, yours faithfully,

RICHARD NEALE, M.D. Lond.

Hampstead, N.W., Aug. 3rd, 1898.

"ON FAILURE OF BRAIN POWER."

To the Editors of THE LANCET.

SIRS,—I am well aware that in general critics must not be criticised, because if this were allowed it would often go very hard with them. At the same time, an author who finds his views materially misrepresented in a review of his book is unquestionably justified in protesting against palpably erroneous statements.

Such a one I find in the review of my book "On Failure of Brain Power" in THE LANCET of Aug. 6th, where I am credited with the opinion that the affection which I am discussing is due to *definite disease* of certain special areas of the brain. "Definite disease" is equivalent with "organic disease" or "structural lesion." Now I have been at particular pains in my book to show that no organic lesions occur in the affection under consideration, but that the malady is owing to the finer nutrition of the neurones of the brain being impaired through insufficient supply of blood and intracellular oxygen (p. 215). If my critic had used the word "disorder" instead of "disease" he would have more accurately represented my meaning.

I am really quite sorry to find he does not consider my teaching on the nature and treatment of the malady "well founded"; but surely an author must sometimes be a little in advance of his time, for why should otherwise books be written? I do not entertain the slightest doubt that in five or ten years time, if not sooner, my views on this subject will be generally accepted by the profession, as I find in practice every day fresh proofs for their correctness.

I am, Sirs, yours faithfully,

JULIUS ALTHAUS, M.D. Berlin.

Queen Anne-street, Cavendish-square, W., Aug. 7th, 1898.

THE PUBLIC CONTROL OF WATER-SUPPLIES.

To the Editors of THE LANCET.

SIRS,—For some six months past we have had the subject of "Public Water Analysis" before the Tunbridge Wells Borough Improvement Association for consideration, and in March we took some action with a view to moving in the direction which your able article[1] upon the same matter touched upon. We have arranged with Maidstone, Crowborough, and other associations to form a deputation and to urge upon the Government the desirability of an Act being passed to carry out such an important proposal. Mr. Cornwallis (the Member for Maidstone) has been interviewed upon the matter and the result you may have seen. Mr. A. S. Griffith-Boscawen, M.P. for Tonbridge division, has also been assisting, and I should think if we could form a strong deputation it might have some weight in helping on the idea. I shall be glad if you could kindly again draw further attention to what is being done and state that the honorary secretary of the Tunbridge Wells Borough Improvement Association would be glad to hear from any society interested in the question, or from any individual prepared to support or willing to join as a representative to assist in augmenting the deputation being formed so as to make it as important as possible. Arrangements are in hand in order that some public and definite expression of opinion may be placed before the proper quarters.—I am, Sirs, yours faithfully,

D. G. CORNWELL, Hon. Sec.

Grove Hill-road, Tunbridge Wells.

THE NATIONAL DEPOSIT FRIENDLY SOCIETY.

To the Editors of THE LANCET.

SIRS,—The following is a copy of a letter addressed to the General Secretary of the National Deposit Friendly Society in answer to an application for observations on the medical tariff of the Society.

I am, Sirs, yours faithfully,

Cardiff, Aug. 6th, 1898. T. GARRETT HORDER.

To F. Letchfield, Esq., General Secretary, National Deposit Friendly Society.

DEAR SIR,—In accordance with your wish I have examined the pamphlets, &c., you were good enough to send me some little time since. I may remark before I enter into details that I have had considerable experience with friendly societies, and that long since I came to the conclusion that it would be a good plan to pay the medical officers of such societies for actual work done in attendance on the sick members. Of course, in arranging the fees to be paid, two things had to be taken into consideration—namely, the proper and sufficient remuneration of the medical officers and the position in life of the members of the society. I freely admit that it is not an easy matter to settle the amount of the fees to the entire satisfaction of both these parties.

According to your rules the following are the fees paid for medical cases in your society:—

	s.	*d.*
One visit with medicine for two days	2	6
Ditto beyond three miles, extra per mile	0	6
Members entitled to over 5*s.* daily sick pay, extra for every 1*s.* above 5*s.* per visit	0	6
Intermediate visits in dangerous cases, extra per visit	1	0
Attendance at surgery and medicines for two days ...	1	6
Fresh supply of medicine for two days	1	0

I notice that some alterations have been made in the above and that now an extra fee of 6*d.* is allowed for cases outside the two-miles radius, that 1*s.* extra is allowed for visits paid between the hours of 9 P.M. and 8 A.M., and that 6*d.* extra is allowed for attendance at the surgery between these hours.

I candidly confess that I do not think the terms offered are sufficiently liberal. To ask a medical man to travel four miles, and supply medicines in addition for a fee of 2*s.* 6*d.*, is hardly reasonable or fair. Neither is the allowance of 6*d.* per mile for visits paid outside the two miles radius nearly sufficient. Again, the extra allowance for night visits and night attendances is far too small. Supposing a member sent for the medical officer in the middle of the night, and the member lives nearly two miles from the doctor's house, do you think the fee of 3*s.* 6*d.* would be a fair and reasonable one for such a journey? With respect to "intermediate visits in dangerous cases" it is not quite clear to me whether the medical officer would receive 3*s.* 6*d.* or 1*s.* for such visits. If it is the latter sum, then I must say it is altogether inadequate.

As it is of the highest importance that candidates should be properly examined by the doctors before being admitted I would suggest that the fee for such an examination should be raised from 1*s.* to 2*s.* 6*d.* That a stricter examination is more necessary in your society than in the ordinary friendly societies is evident from the fact that you admit members up to fifty-five years of age.

I am, dear Sir, faithfully yours,

Cardiff, Aug. 5th. T. GARRETT HORDER.

[1] THE LANCET, April 23rd, 1898.

"THE ALLEGED DEARTH OF QUALIFIED ASSISTANTS."

To the Editors of THE LANCET.

SIRS,—I have read with great interest the correspondence in THE LANCET under the above title. Now, Sirs, I am sure that anyone who has read the correspondence cannot fail to see that there is something seriously wrong with general practice, as undoubtedly the letters represent the opinions of the majority of general practitioners. Speaking personally, although a young man I have had experience as an assistant in several practices and have a father and two brothers all in separate practices as well as having been intimately associated for many years with general practitioners. The result is that I have never yet known one who *cæteris paribus*, and presuming that he fulfils his duties properly, has not what "Practitioner"[1] describes so aptly as "a life of hardship, a scanty income, constant harass," &c., and I am so disgusted with the life of the ordinary medical man that had I the opportunity I would even now make a fresh start at another calling, although I love the work *per se* and the study of medicine. As regards the question of employer and assistant I think there is a lot to be said on both sides. My first assistantship produced £80 per annum, indeed, and was not a happy one. Although well treated as far as board and lodging and courtesy went, the life was wretched, as I was so tied down—always on duty, except perhaps for an hour in the day and after 8 P.M., when one was just as likely to be called out as not; no opportunity for games, and as my employer generally went out every night I had to be in, and if allowed a few hours to run up to town once a month to visit a theatre it was considered sufficient. But I do not think the salary was inadequate, as I am sure the expenses of a practice *at present* are so heavy, owing to poor fees, clubs, and underpaid appointments, that any practitioner doing less than £1000 a year cannot afford to pay more to an assistant than £100 a year indoor, if he wants to put by anything at all, although the average salary of a qualified assistant, which I should put as £70 per annum, is indeed what one would pay a *first-class butler*. And now let me consider why the general practitioner is so hard pushed and if a remedy can be pointed out.

In the first place, thousands of pounds which ought to go to medical men go to quacks—i.e., herbalists and bone-setters—and prescribing chemists. And, as "Assistant"[2] says, the General Medical Council ought, in the interests of the public as well as in those of the general practitioner, to immediately suppress them, and I am glad to see the Home Secretary promised recently in Parliament to give the matter his attention. Let us hope he will do so. And here I may mention that in Denmark at any rate prescribing by chemists is illegal.

Secondly, we have medical fees, and, as "M.B., B.Ch. Dubl."[3] suggests, these should be fixed by law. I daresay this would be difficult, but suppose that the General Medical Council obtained powers to maintain a proper standard of professional etiquette. I take it that to attend people at starvation fees is or ought not to be etiquette. The Council can erase a man from the Register for advertising, why not for taking halfpenny fees, as this is degrading? Supposing they enacted that any man who took midwifery under £1 1*s.* a head, and who visited under 2*s.*, and supplied medicine and prescribed under 2*s.* a head, and who engaged to attend anyone in a club under 7*s.* 6*d.* per annum—which is only 1½*d.* per week—would be guilty of unprofessional conduct what a difference it would make. And I consider that all men earning over 15*s.* a week are able to pay 1½*d.* per week for medical attendance. All those who could not afford to pay this should be treated by the parish or hospital and consequently the Local Government Board would have to raise their salaries. These, again, are a great grievance, as all the Poor-law medical appointments are underpaid. My father, for example, has five parishes under him with a total of about 100 paupers some five miles distant, and others two or three, and he is expected to attend and provide them with medicine for about £30 a year. This is disgraceful, and why should it be so seeing that solicitors holding Poor-law appointments are at any rate fairly paid?

I cannot think the Local Government Board can be aware how underpaid these posts are or they would try to remedy the evils. And medical officers to clubs should all

[1] THE LANCET, July 9th, 1898, p. 104. [2] THE LANCET, July 2nd, 1898, p. 53.
[3] THE LANCET, July 23rd, 1898, p. 229.

unite in seeing that the clubs are not abused by people well able to be private patients. Lastly, there is the question of hospital abuse, which is assuming alarming proportions and demands immediate legislation.

To sum up, who is responsible for this state of affairs? The answer is apparent—the General Medical Council. Why do they not adopt more stringent remedies? Because that body consists almost entirely of consultants with scarcely any general practitioners and these men do not know and cannot understand what hardships the general practitioner has to contend with and remain satisfied with a few trifling reforms. I am sure that if they had an equal number of consultants and general practitioners on their staff a great deal more would be done for professional etiquette. I commend their recent action with regard to unqualified men, hard though it may be on some, for is it not a case of "the survival of the fittest"? and we are the fittest.

Our only chance is to immediately agitate to get the same number of general practitioners on the Council as there are consultants, or even more, as we are undoubtedly the body of the profession and therefore ought most certainly to have our own representatives in sufficiency, and then the Council will obtain from Parliament more extensive powers to enable them to raise the standard of, to mitigate the evils affecting, and to remunerate more properly the body of the profession.

I call therefore on all those who have written on this subject recently and all those who are interested in and approve of this scheme to join with me and at once enrol ourselves into an alliance of general practitioners, call it what you will, and to invite all other medical improvement associations to join us in one great body and let us start a journal devoted to the subject or ask permission to inaugurate our society in the columns of THE LANCET—that journal which has already done so much to raise the dignity of the profession; and, in the first place, petition the General Medical Council to allow us to be more fitly represented on their rolls and then urge upon our representatives to take immediate action to reform the state of the profession.

I am, Sirs, yours faithfully,

ASPIRATOR.

ADDRESSES AT MEDICAL CONGRESSES.

To the Editors of THE LANCET.

SIRS,—The Presidential Address of Sir Thomas Grainger Stewart at the recent meeting of the British Medical Association in Edinburgh was more than a *résumé* of medical progress during modern times, but not so much more that it would be very unfair so to describe it. Professor Fraser, in his Address in Medicine, gave a brief history of pure medicine during the twenty-three years which had elapsed since the last meeting of the Association in Edinburgh. Professor Annandale recorded the advances of modern surgery in the first part of his Address in Surgery. All three learned gentlemen gave thoughtful and informatory addresses, but I question whether their hearers would not have preferred that a more personal note should have been struck. It has lately become the invariable custom for the addresses at medical congresses—I refer in particular to those delivered in plenary assembly, but the Presidents of Sections often do exactly the same—to assume the form of stocktaking. This sort of address is disappointing to the general practitioner. Eminent physicians and surgeons are wasted in delivering such speeches, for the subject matter lies within the ken of their audience beforehand. What the medical public desires to get from its leaders is a personal expression of opinion upon something; they seek a sign, not a summary. It must not be supposed that I do not recognise the pains and the erudition which have gone to the making of the addresses which you published last week and the week before. I recognise their value, but, the speakers being the men that they are, I cannot but regret that their audience did not have from them something more distinctive.

I am, Sirs, your obedient servant,

Aug. 8th. M.B.

VENESECTION IN CHRONIC BRIGHT'S DISEASE.

[DR. SAUNDBY requests us to publish the following letter which he has addressed to Professor Ewald.]

DEAR PROFESSOR EWALD,— the Section of Pharmacology and Therapeutics at Edinburgh, during your speech on the treatment of chronic Bright's disease you expressed surprise that in the last edition of my lectures on Renal and Urinary Diseases I had omitted all reference to the value of bleeding in uræmia. I could only reply that if that were the case it was an undoubted omission, although it was rare for me now to have recourse to bleeding in these cases. On returning home, however, I have turned to the place in my book and find you were mistaken, as on page 177, under the heading "Treatment of Uræmia," are these words: "In obstinate convulsions 12 to 16 ounces of blood may be taken from the arm. Hemiplegia and coma call for bleeding to the like amount, but the hot-air bath recovered one patient from coma after the attempt to bleed had failed."

I am sending this correction to the press.

Yours faithfully,

ROBERT SAUNDBY.

Edmund-street, Birmingham, Aug. 6th.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

The Probable Duration of the Plague Epidemic.—Lessons from History.—Hope from further Scientific Investigations.

Now that the plague has so greatly subsided in nearly every place which has been attacked speculation is rife not only as to the recurrence of further outbreaks but as to the probable duration of the plague. That its apparent extinction in a district is no guarantee against a re-importation or a recrudescence has unfortunately been proved by many instances. The gradual spread of plague over a larger and larger area is also an additional source of danger for the perpetuation of the scourge. The clearest indication as to its further continuance seems to be derived from the history of plague in former times. It is generally recorded to have attacked districts or towns for a number of years in more or less regular succession. In Central India it existed from 1813 to 1821, in Kathiawar from 1816 to 1821, in Gharwal from 1849 to 1854, again from 1875 to 1877, and a third time from 1884 to 1897. In Hong-Kong it has lasted since 1894. Older writers describe what was probably plague as existent in the Punjaub from 1618 for eight years, in Ahmedabad from 1683 to 1689, and in Surat from 1684 to 1690. Short intervals of apparent freedom have characterised nearly all these outbreaks. In most cases it appears that the larger the population of a town or village the greater seems to be the virulence and intensity of the outbreak and the longer its duration. The older records, while obviously incomplete, seem to show that a much larger proportion of the population was carried off by the disease in former epidemics than has been recorded anywhere during the present visitation of plague. While there is some comfort from the latter observation there is very little hope of escaping from a further series of outbreaks for perhaps many years to come. On this point Dr. Roux has expressed his opinion that plague in India "would remain with us in Bombay for a long time." He affirmed his belief that it would be several years before we should see the last of it. Dr. Yersin has also stated that plague would be a recurring epidemic for many years. It must be admitted that all our sanitary measures have failed to eradicate the disease. While we stick to all sorts of repressive sanitary measures which were exceedingly difficult and almost impossible to apply, and have proved over and over again almost complete failures, we have amongst us several foreign *savants* who are working on quite different lines — for prophylactic inoculation, M. Haffkine; for curative serum, Dr. Simond, as representing Professor Roux and the Pasteur Institute; and Dr. Gallioti, representing Professor Lustig of Florence. As there is no difficulty in the manufacture of either the prophylactic fluid or the various kinds of curative serum, and as both offer some hope of success, it seems extraordinary that the Government does not engage English men of science to pursue further investigations in these directions. Both systems are capable of very considerable improvement. It is impossible that the expensive methods of sanitary control as hitherto adopted can go on for years. Every city would be bankrupt and perhaps India in insurrection, so that either plague will have to be left almost entirely to take its own course or experimental science must step in and supply

the antidote. Prophylactic inoculation is attended by the practical difficulty that we can only get a small proportion of the people to be inoculated. Like vaccination for small-pox it can only prove really successful when performed on a large scale. On the other hand, a curative serum if successful would rob the disease of its terrors and make the early discovery of fresh cases possible. Hope from this quarter is engendered by the better results from the most recent experiments. If it were possible to reduce the mortality to 20 or even to 30 per cent. plague would be almost disregarded. By these scientific means and by these means alone conquest over the plague seems possible.

July 16th.

THE SPANISH-AMERICAN WAR.

(FROM A SPECIAL CORRESPONDENT.)

Camp Cuba Libre, Jacksonville, Fla., July 26th, 1898.

MEDICAL officers as well as line officers are all anxious to go to the front. My experience is limited to one army division, but in this one division hospital, the medical wards of which are under my charge, many interesting problems are continuously presenting themselves. The hospital of the Second Division of the Seventh Army Corps is in a pine-grove near the division camp. It consists entirely of tents. A central circular thirty-foot tent forms a convalescent ward, and radiating from this the floored army hospital tents are arranged in rows of six, the six being broken into groups of twos by arbors which admit air and permit of separation of the patients. There are additional single isolated tents for the treatment of the acute or noisy cases, and for a surgical operating-room, clinical office, and dispensary. The medical officers' tents face the hospital at a distance in its front, and the hospital corps nurses and stewards are encamped in the rear. Each hospital tent contains six large and comfortable canvas-covered cots. Over each cot, pinned into the seam of the canvas, is a curtain-hook pin on which hangs a printed clinical chart bound in pad form. These forms I devised and they were printed for me by the Red Cross Society.

The sickness in this command, though not excessive, is already so great as to have increased this hospital beyond its regulation size. We have now about 250 patients, in great part medical—indeed nearly all are fever cases. The fevers are typhoid and malarial, nearly all of the fatal cases being typhoid fever. There were from May 29th to July 22nd 808 patients admitted to the hospital, with 13 deaths, in a command of 13,000 men.

The one great favourable feature of this camp is its most excellent water-supply. Artesian water in unlimited quantities is piped to the entire camp. This water is above the suspicion of germ contamination and its properties are of the best. The source of supply is constantly guarded, to prevent poison being added to the water, though the poison which could be used to contaminate such great quantities of water I have found no one able to suggest.

This, in brief, is the situation with this army division. We have good water, hot sun, heavy rains and dews, the intemperance usual in armies, and some necessary work. The result is much typhoid fever and more of the shorter continued malarial fevers, of which I may write you more.

We have had in all three interesting epidemics of typhoid fever. First, nearly all our cases came from the Virginia regiments. The men reported bad water at the Richmond camp. Post-mortem examinations showed the most pronounced lesions. The second epidemic occurred in Company F of the Second Illinois Regiment. On May 30th the members of this company were severely poisoned by the meat served them. Nearly all the men suffered with severe abdominal pains, vomiting, and diarrhœa, some even becoming unconscious. Two weeks later we had very many men sent to the hospital from this company with typhoid fever. Three of these patients died, two with perforation, one with meningeal symptoms. Did the beef contain the typhoid bacilli? Last week our third epidemic began. From the First Wisconsin Regiment we have had 60 admissions, many of which are developing typhoid fever. One unexpected fact is presented by a study of our records. In June, the six Northern regiments in this division sent 172 men to the hospital, while the three Southern regiments sent 216 sick men to us—the South thus, with half the number of regiments, sending 25 per cent. more patients. One would have thought that Southern men could stand the Florida climate better than Northerners.

I believe the hospital corps is the hardest worked part of the army, even without any other battle than that with disease germs. We volunteers find the regular army surgeons most pleasant. They overlook our lack of knowledge of military forms and facilitate our work in other respects. All realise the difficulty of hastily meeting the needs of so great a military force at once and attach little importance to hastily made and unjust criticisms of the medical department of the army.

But no one should write from the front without giving great credit to the Red Cross Society for the great work it is doing. Without the aid of this society it would have been difficult to care for the sick in this hospital. Each day the Red Cross gives us 50 gallons of milk, 2000 pounds of ice, 30 dozens of eggs. Besides this it has built for us store-houses, floored our tents, given us hundreds of night shirts, pyjamas, pillows, sheets, buckets, bedpans, and dozens of other articles necessary for the care of the sick. In military channels the stream of supplies flows slowly and with many stops and much formality, but Dr. Kent, who represents the Red Cross here, gives freely and without delay. He has no regulation that prescribes how many bed pans one division must use, but gives all which are needed. This week, with the people of Jacksonville furnishing the motor power, he is going to put electric fans in all the tents.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

Prosecution under the Factory Act at St. Helens.

A PROSECUTION was instituted at St. Helens Police Court under the Factory Act, 1891, against Richard H. Twist for a breach of the Act in not providing the workpeople in his factory with suitable overalls and headpieces as a protection against lead-poisoning in the manufacture of china and earthenware, such as pans, mugs, &c., which have to be glazed by means of the use of lead. Mr. Grant, the Government inspector under the Factory Acts, visited the works on July 1st and found a man and a woman engaged in the process of preparing the china for dipping. He found that they had no overalls and never had had any. The man had worked there for some years and owing to a serious illness which was pronounced by Dr. Casey to have been due to lead-poisoning was laid up for six months. The defendant controverted the statement that his employé was suffering from lead-poisoning and said that his illness was due to the effects of drink. He stated that he used very little red-lead, but mainly lead-ore, and that he did all the mixing himself; that the girls and men had merely to wash the pails round. He also stated that there were no dust and no brushing. The inspector pointed out to the magistrates that the danger to individuals engaged in these works arose from actual contact with the lead. They got the lead over their hands, and it got under their finger-nails and through the pores of the skin. As the defendant had fairly observed the rest of the rules as regards the manufacture of his special wares the magistrates decided not to convict in this case, but cautioned the defendant against a similar breach of the regulations of the Factory Act in the future.

Revocation of the Appointment of a Medical Referee under the Workmen's Compensation Act.

The appointment of Mr. J. D. Crawford as one of the medical referees under the Workmen's Compensation Act to Circuit No. 6, which was notified in THE LANCET of July 16th, has been cancelled by the Home Secretary. Dr. Thomas Clarke, the chairman of the hospitals committee of the Liverpool City Council, has been appointed in Mr. Crawford's place.

Liverpool Consumption Hospital.

Lady Willox, the wife of Sir John Willox, the member for the Everton Division of Liverpool in Parliament, has been the means of raising the sum of £200 towards the new building fund through a bazaar promoted by her ladyship at the hospital.

Liverpool Assizes: False Charge against a Wigan Surgeon.

The grand jury threw out the bill in the case of Mr. James

Brown, who had been indicted on the inquisition of the coroner for the wilful murder of a Mrs. Sharples by performing an illegal operation upon her at Ince. The charge rested upon such slender foundations that the case had been dismissed at the usual magisterial inquiry previously held. The grand jury had no hesitation in ignoring the bill, believing the charge to have been groundless. Mr. Brown is to be congratulated upon the result and at the same time deserves much sympathy for having been placed in such a terrible position.

Low Death-rate at Southport.

The death-rate at Southport during the month of July was exceptionally low. Locally it was only 7·82 per 1000 of the inhabitants. The gross death-rate was 9·48 per 1000. These figures compare favourably with those of the corresponding period of last year which were 10·21 and 12·88 per 1000 respectively.

August 9th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Congress of the Royal Institute of Public Health in Dublin.

THE Lord Mayor and corporation of Dublin have agreed to the request of the Exhibition Committee of the Congress to be present in state on the occasion of the opening of the Health Exhibition at Earlsfort-terrace on Aug. 18th and the High Sheriff has sent out numerous invitations to a luncheon at the Royal University Buildings for the same day. The hon. secretary of the Congress Hospitalities Committee has reported that in consequence of the large number of applications which have been received for tickets for the banquet at which His Excellency the Lord-Lieutenant will be present on Aug. 20th, the committee have been compelled to direct the attention of the public to the fact that the accommodation at the Royal College of Surgeons in Ireland is of a limited character. The following is a list of those who previously to Aug. 5th had signified their intention of attending the banquet:—General Dunham Massy, C.B., the Right Hon. the Lord Chancellor of Ireland, Professor Armstrong (Edinburgh University), the Right Hon. the Lord Mayor of Belfast, the Right Hon. Viscount Bangor, Mr. A. C. Cope (Board of Agriculture), Baron De Robeck, Sir George Duffey, the Right Hon. Baron Emly, Mr. John Kells Ingram, LL.D., Mr. Thomas Stafford (Local Government Board), Mr. Henry Jones (hon. secretary to the Royal Institute of Public Health), the Hon. Mr. Justice Kenny, the Right Hon. the Lord Mayor of Liverpool, the Right Hon. Viscount Monck, the Right Rev. Gerald Molloy, D.D., D.Sc., Dr. James Creed Meredith, LL.D. (secretary to the Royal University, Ireland), the Right Hon. Viscount Powerscourt, Dr. Salmon (Provost of Trinity College), Sir Andrew Reid, K.C.B., LL.D., Hon. Mervyn R. Wingfield, Mr. T. W. Russell, M.P., Professor W. R. Smith, M.D., D.Sc., the Mayor of Huddersfield, Mr. J. J. M'Grath, LL.D. (secretary to the Royal University), Baron de Brault, the High Sheriff of Dublin, Professor Shaw (Trinity College, Dublin), Mr. J. C. Thresh, M.D. Vict. (Chelmsford), Lord Rosse, and Mr. Thomas A. Mooney, LL.D. (secretary to the Local Government Board). At a meeting of the Hospitalities and Excursions Committee, held on Aug. 5th, Sir Christopher Nixon stated that a number of the members would be invited to inspect the Mater Misericordiæ Hospital, where light refreshments would be provided. Many other entertainments, &c., have been announced for the guests, including those which are noted in the following abridged list: Thursday, Aug. 18th.—A luncheon by the High Sheriff of Dublin at the Royal University Buildings. In the afternoon Surgeon-General and Mrs. Preston will give a garden party at Moncktown, while in the evening a dramatic and musical entertainment will be arranged by the Corinthian Club at the Lyric Hall, and a promenade concert at the Health Exhibition. Friday, Aug. 19th.—Organ and pianoforte recitals at the Royal University and luncheon at the Mater Misericordiæ Hospital, and a garden party at Clonskeagh, where Sir Christopher and Lady Nixon will entertain the guests. In the evening the Lord Mayor will welcome all the visitors at a ball in the Mansion House. Saturday, Aug. 20.—Alderman the Right Hon. J. M. Meade and Mrs. Meade will give a garden party at Merrion, and there will be a banquet at the Royal College of Surgeons in Ireland, at which the Lord-Lieutenant will be present. On Monday the Lord Mayor of Belfast will receive visitors there at a luncheon, while excursionists to the county Wicklow will be entertained by Sir Henry and Lady Cochrane at a garden party at Bray.

The Apothecaries' Hall of Ireland.

The first examination by the Apothecaries' Hall of Ireland, in conjunction with the Royal College of Surgeons in Ireland, which has been held since the decision of the General Medical Council and the appointment of the new board of examiners has just concluded. Two candidates are announced to have passed the final examination.

The Surgeoncy to the Dublin Metropolitan Police.

Dr. Henry Oulton has just been appointed chief surgeon to the Dublin Metropolitan Police.

Sanitary Condition of Magherafelt.

The Local Government Board have written to the Magherafelt Board of Guardians drawing their attention to a report of Mr. Vesey, medical officer of health, relative to the insanitary state of that town and giving their opinion that a large portion of the place was much in need of improved sewerage and that the guardians would incur grave responsibility should an outbreak of infectious disease occur in consequence of their failure to remedy the defects pointed out by Mr. Vesey. The matter has been referred to the Magherafelt Dispensary Committee for further consideration.

Queen's College, Belfast.

Her Majesty's Commissioners for the 1851 Exhibition have intimated to the President of Queen's College that they have nominated that institution to a science research scholarship of the annual value of £150 tenable for two years. The person nominated must be an alumnus of Queen's College, Belfast.

The Belfast District Lunatic Asylum.

At a meeting of governors held on Aug. 8th it was decided, in reply to a letter from the Board of Control, that notwithstanding the urgency for the building of the new asylum at Purdysburn it would be wise to fall in with the suggestion of the Board of Control and postpone the matter for a few months until the Local Government Bill becomes law. The committee appointed to examine into the sewerage system at Purdysburn reported that they endorsed the statement of their medical superintendent that it was inadequate and uncertain in its action. I am afraid that eventually the sewers of the asylum will have to be connected with the main town drainage system. The committee of governors report most favourably of the way in which Dr. Graham (the medical superintendent) has carried out his plan of a dairy and tillage farm at the asylum. They found every department in a most satisfactory condition, but they regret that the most valuable portion of the tillage ground will be taken from them for the site for the new Infectious Diseases Hospital, as it is in this part the test crops have been grown and it is better adapted for cultivation than any other portion of the farm.

The British Pharmaceutical Conference at Belfast.

The thirty-fifth annual conference of this association opened in Belfast on August 9th, the meeting being held in Queen's College, when the members were welcomed on behalf of the city by the Lord Mayor (Alderman Henderson, M.A., J.P.) and by the President of the College (Dr. Hamilton). The chairman and members of the Ulster committee gave a reception and conversazione in Queen's College on the same evening, and the Lord Mayor is to entertain the members and his friends at a garden party on Aug. 10th. Thursday is to be devoted to a coast trip in county Antrim. The President of the society this year is Mr. Charles Symes, Ph.D., F.L.S., of Liverpool. Nineteen papers are announced on the business programme.

August 9th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Results of Suprapubic Cystotomy in Cases of Enlarged Prostate.

AT the meeting of the Academy of Medicine, held on August 2nd, M. Poncet of Lyons read a paper treating of the results obtained by creating an artificial opening into the

bladder, of either a temporary or a permanent nature, the opening being above the pubes, in cases of prostatic trouble. Since 1895, M. Poncet has performed or caused to be performed 81 suprapubic cystotomies, and the total number of cases to which he referred was 114. Of these 114 patients 87 recovered and 27 died. M. Poncet divided the 114 cases into three groups. Group 1 comprised 39 patients who presented no symptoms of uræmic or other toxic affection and of these 37 were cured. Group 2 comprised 29 patients suffering from acute uræmia at the time of operation, and of these 12 died. Group 3 comprised 46 cases of chronic uræmia, and of these operations 33 were successful and 13 patients died. These figures show that success in the operation of suprapubic cystotomy is in direct relation to the gravity of the patient's condition as regards the general condition and the degree of uræmic poisoning, from which M. Poncet argued that early intervention was essential. The operation entirely does away with urinary retention and all its accompanying effects which are so generally fatal. In support of his arguments M. Poncet brought forward many cases, among which were the two following: A patient aged seventy-eight years, who was suffering from uræmic coma, and had a rectal temperature of 40·6° C., was operated upon. At present, four years and a half after the operation, he is well, and can hold his urine for three or four hours during the day and for even longer at night. All the urine passes by the hypogastric opening. Another patient operated upon six years ago to-day follows his occupation of a blacksmith. He can retain his urine for from three to five hours. It is passed by the hypogastric opening, and the jet is projected for a distance of thirty or forty centimetres.

The Nantes Congress.

On Aug. 5th the annual meeting of the French Association for the Advancement of Science commenced at Nantes. The medical section revealed some features of great interest and the meetings passed off by no means quietly. Sundry disturbances occurred in the town owing to the choice as president of the meeting of Professor Grimaux, who is extremely unpopular among the townspeople on account of the part which he took in the recent Zola trial. The inhabitants of Nantes have held several demonstrations in the streets demanding his withdrawal from the presidentship. Three or four times has the venue of the meetings been changed on account of its being impossible for the president to obtain a hearing. Finally they had to be held in a room at the College only capable of holding very few listeners and from which the public were rigorously excluded. The most interesting discussion was that upon Diabetes, introduced by Professor Lepine of Lyons. By means of a statistical statement drawn up with great care from the civil registers and the hospital reports of the city of Lyons M. Lepine was enabled to give with very fair accuracy the proportion of diabetics in the large urban districts, and the figures seem to show that this disease is actually increasing, this being in accordance with the researches of M. Bertillon. The number works out in the proportion of about 5 per 1000. M. Lepine in examining into the distribution of diabetes was struck by the frequency with which it occurred in the same communes, so that he was compelled to allow that the cause must be an hereditary one, or contagion, or due to some local influence. Dr. Loin of Tunis thought that a hot climate had something to do with it. He found diabetes to be very common in the colony of Tunis, especially among the Jews. As to its etiology, he was inclined to give the first place to errors in diet—namely, a diet very rich in starch and therefore in sugar. Want of exercise and sedentary occupations also appear to be a cause, for diabetes is very rare among working men and soldiers. There would seem to be no relation between diabetes and venereal excess or between diabetes and malaria, and the influence of alcohol is very doubtful. Climate is not sufficient to explain it altogether for diabetes is rare in the hotter countries. The commonest cause of death is gangrene but sometimes it is due to a diffuse carbuncular inflammation. Death from tuberculosis is very rare in Tunis, even among the military. Treatment by drugs is of little use but strict attention to hygienic details is everything. According to M. Leduc the principal cause lies in errors of diet and more especially of drink. The white wine so commonly drunk is very prone to produce fatty degeneration of the liver, and this is probably the principal cause. The question as to whether diabetics should be allowed potatoes brought out a variety of opinions. M. Mosse of Toulouse by dint of making many and careful analyses has arrived at the conclusion that the sugar shows a marked diminution when potatoes are substituted for bread. M. Rappin considered that the contradictory results arrived at with regard to potatoes were due to the observers not having sufficiently taken into consideration the various kinds of potatoes, variations which are shown to exist by the different ways in which cultures of bacilli develop upon different kinds of potatoes chosen as a culture ground.

August 9th.

Obituary.

WILLIAM SAVAGE SPEER, M.D., M.CH. R.U.I.

THE death is announced of Dr. Speer, which took place at his residence, Clifton-street, Belfast, from meningitis, on Aug. 3rd, after a short illness of a fortnight, during ten days of which he was confined to his bed. Born in the neighbourhood of Castledawson, co. Derry, fifty years ago, Dr. Speer received his medical education at Queen's College, Belfast, and graduated M.D. in the old Queen's University, 1874. For the past twenty-four years he had practised in Belfast, and during the early part of his career he assisted his brother-in-law, Dr. David Johnston, who died a month ago. Dr. Speer was an extremely busy man and he had one of the largest middle-class practices in Belfast. Possessed of good abilities and being most conscientious and anxious to do his utmost for his patients, Dr. Speer was greatly respected and liked by his very large *clientèle*. Apart from his position as a skilful practitioner of the healing art Dr. Speer was a deeply-religious man and he took the warmest interest in all matters concerning the church to which he belonged and for a great many years he conducted a religious service for men in connexion with one of the Belfast church associations every Sunday morning. Dr. Speer leaves a widow but no family. He was buried on August 5th at the City Cemetery, the immense concourse of patients and medical men present indicating the marked respect in which he was held. By the death of Dr. Speer Belfast and the medical profession have lost a man of great ability and of the highest honour, who spared neither time nor pains in the interest of his friends and his patients.

WILLIAM HENRY ACKLAND, M.D. ST. AND., M.R.C.S. ENG., L.S.A., J.P.

DR. W. H. ACKLAND died at Plymouth on Aug. 7th, at the age of seventy-three years. The deceased received his medical education at University College, London, obtaining the M.R.C.S. Eng. qualification in 1847 and the L.S.A. a year later. In 1862 he was admitted M.D. at St. Andrews University. Dr. Ackland was for many years a well-known and highly-esteemed practitioner at Bideford. He was formerly physician and senior medical officer to the Bideford Infirmary and medical officer of health of the Bideford Urban District, and at the time of his death was senior magistrate for the borough. Dr. Ackland took the greatest interest in the development of Bideford and the district and was an intimate friend of the late Canon Charles Kingsley. A few years after the appearance of Kingsley's "Westward Ho!" Dr. Ackland was one of the directors of the Westward Ho! Hotel and Villa Company, and he it was who suggested the name for the place after his friend's book, for Westward Ho! in those days consisted of a farmhouse and a cottage. He was for several years President of the Devon and Exeter Medical Benevolent Society. He retired from practice a few years ago and removed to Plymouth.

FLEET-SURGEON CHARLES ALBERT MACAULAY, M.D., M.CH. R.U.I.

NEWS was received in Plymouth on July 27th of the death at Wei-Hai-Wei, China, of Fleet-Surgeon Charles A. Macaulay of the flagship *Centurion*. He was taken ill on June 14th and he died on the following day. The funeral took place on June 16th, the deceased being the first to be buried at Wei-Hai-Wei. Fleet-Surgeon Macaulay joined the Royal Navy on Sept. 30th, 1875, and reached the rank of fleet-surgeon on

March 5th, 1896. He was surgeon on the battleship *Alexandra* at the bombardment of Alexandria on July 11th, 1882, and landed there with the naval brigade. The deceased was also at the seizure of Port Said and was senior medical officer of the seamen and Royal Marines who landed there. He was also with the naval brigade at Ismailia and was present at Tel-el-Kebir, receiving for his services the Egyptian medal, the Alexandria and Tel-el-Kebir clasps, the Medjidie of the fourth class, and the Khedive's bronze star.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—In Leopold von Dittel, Austria, and indeed all Europe, loses a great surgeon. He was born in 1815 and took his degree in Vienna in 1840. At first he was in general practice and it was not until he was approaching his fortieth year that he took up surgery as his special subject, becoming assistant to Professor von Dumreicher. In 1856 he was himself appointed one of the surgeons of the Vienna General Hospital and some nine years later extraordinary professor. His most important papers had reference to the surgery of the urinary organs, but his name is perhaps most generally known in this country in connexion with the method of excising tumours by means of an elastic ligature. He was very popular amongst his medical brethren and was President of the Vienna Medical Society.—Dr. Francesco Trombetta, Professor of Clinical Surgery in the Messina Medical School.—Dr. Du Mesnil, physician to the Vincennes National Asylum.—Dr. Louis E. Livingood, Assistant Professor of Pathology in the Johns Hopkins University, Baltimore.

DIPHTHERIA IN LONDON.—In the four weeks ended on July 16th the amount of diphtheria in London differed but little in the aggregate from that recorded in the preceding period of like duration ended on June 18th. In the June period the total of notifications of the disease in London, corrected for duplicates, was 828, yielding a weekly average of 207 cases, while in the July period the total was 849, giving a weekly average of 212 cases. In June two districts of London escaped invasion by diphtheria, but in the July period every sanitary area yielded cases, although in three instances only single cases were recorded, nine cases being notified in all in six districts. In June only one district had upwards of 50 cases, but in July there were five such districts, with an aggregate of 290 notifications. In the matter of mortality the 106 registered deaths of the June period, being 26 weekly on the average, gave place to 116, or 29 as a weekly average in July; and the case mortality of 12·8 per cent. of June became 13·7 per cent. in July. Thus alike for amount and fatality the two periods were not dissimilar. In the Outer Circle the 45 deaths from diphtheria in June were replaced by 41 in the July period, the weekly numbers of 11, 11, 10, and 9 making the latter total, showing an evenness of death record throughout the period.

BRITISH LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL ASSOCIATION.—A meeting of this society was held on July 22nd, Dr. Dundas Grant, the President, being in the chair.—Dr. Furniss Potter showed a case of Subacute Myringitis affecting both membranes in a man, aged thirty-seven years, who stated that he could hear perfectly well up to the onset of his present trouble three months ago.—The President narrated a case of Thrombo-Phlebitis of the Sigmoid Sinus following Chronic Suppuration of the Middle Ear, in which recovery followed evacuation without ligature of the jugular vein.—Mr. George Stoker showed cases of Lupus and Rodent Ulcer treated with inoculations of staphylococcus pyogenes aureus previously exposed to the action of oxygen, by which Mr. Stoker thought an antitoxin was produced.—The President showed a case of Rhinoscleroma in a native of Russia, and Mr. St. George Reid showed a Culture Tube and Microscopic Specimen of the Capsuled Bacillus of Rhinoscleroma from the President's case.—Dr. Middlemass Hunt described a case in which he had performed Thyrotomy for Malignant Disease of the Larynx in a man over eighty years of age. He also described a case illustrating the effects on growth and development of removing nasal obstruction; the patient, a girl, aged seventeen years, had in seven months after the removal of nasal polypi grown 3½ in. and had gained 3 st. in weight.

THE BRITISH MEDICAL ASSOCIATION.

MEETING AT EDINBURGH.

THE SECTIONS.

SURGERY.

FRIDAY, JULY 29TH.

DR. ROVSING (Copenhagen) read a paper on Some Obscure Hæmorrhages from the Kidney and their Treatment by Nephrotomy. He pointed out that cases of hæmaturia occurred in which the blood was derived from only one kidney, as shown by the cystoscope, in which no definite cause could be assigned for the hæmorrhage. He narrated several cases of this kind in which nephrotomy had been followed by recovery. In two of the cases bacterium coli was present in the urine, but Dr. Rovsing was inclined to think that this had nothing to do with the hæmorrhage. He considers it possible in some cases that the bleeding is caused by displacement of the kidney giving rise to some venous congestion.

Dr. T. H. MORTON (Sheffield) described the chief conditions preventing replacement in dislocation of the shoulder and exhibited a Working Model of an apparatus he had designed to assist in replacing the head of the humerus. It consisted essentially of a hinged pad by which pressure was brought to bear on the bone close to the head.

Mr. R. H. PARRY (Glasgow) described three cases of spasmodic torticollis in which the deformity was persistent and long lasting and was entirely due to spasm of the muscles and not to their permanent contraction. He effected a cure in all the cases by resecting a portion of the spinal accessory nerve on one side and dividing the cervical plexus on the other, in this way removing the spasm of one sterno-mastoid and the opposite occipital muscles. The recovery was complete in all the cases (one of which was shown) and no permanent paralysis was left.

Mr. NOBLE SMITH (London) said he had treated 16 cases by this method and he looked upon the operation as well established. He had found movement return early.

Professor KOCHER (Berne) said he had frequently seen recurrence of the deformity in these cases and now he always divides the sterno-mastoid on one side and the occipital muscles on the other.

Mr. J. HUTCHINSON, jun. (London), read a paper on Removal of the Gasserian Ganglion for Trigeminal Neuralgia, illustrated by the notes of a successful case. He pointed out that there were two routes by which the ganglion might be approached: (*a*) one by resecting (temporarily) the zygomatic arch and trephining around the foramen ovale (this might be called the "pterygoid" route); and (*b*) by opening the skull through the squamous plate and raising the temporal lobe from the middle fossa without piercing the dura mater. He showed that it was not necessary to ligature the middle meningeal artery. He expressed the opinion that the temporal route would be always preferred in future, as, though difficult, the operation was accompanied by less risk than the other and much less deformity resulted.

Mr. MAYO ROBSON (Leeds) had had three cases which were not perfect successes. By the pterygoid route he thought some beneficial effect could be made on the ganglion by pulling forcibly on the third division of the fifth nerve.

Dr. W. BRUCE (Dingwall) read a paper on the Nature and Treatment of Sciatica. He attributed sciatica always to disease of the hip-joint, occurring especially in those possessing the uric acid diathesis, and he had met with success in treatment of sciatica by acting on this theory of its causation.

Dr. J. CRAWFORD RENTON (Glasgow) contributed a paper on the Surgical Treatment of Sciatica. He had found in many persistent cases that extensive adhesions existed around the nerve and recovery had followed their division. He urged the advisability of cutting down on and freeing the nerves in all cases which did not recover rapidly.

Dr. ROBERT KENNEDY (Glasgow) gave the details of Four Cases of Traumatic Musculo-spiral Paralysis in which the palsy followed fracture of the humerus. In all the cases rapid improvement followed the operation of freeing the nerve. The delayed return of muscular power in some of

these cases he was inclined to attribute to the muscles rather than to the nerves.

Mr. MAYO ROBSON (Leeds) thought that however long the time since the injury every case of traumatic paralysis should be operated on. He had seen sensation return in twenty-four hours.

Professor DOYEN (Paris) exhibited some Instruments which he had invented for Operations on the Skull. Most of them were of great ingenuity and were worked by electricity. With the use of these instruments it was possible to remove a flap of bone four inches in diameter in eight minutes. He further described a method he had devised for Resection of the Bowel. The end of each portion of intestine is closed by a "purse" suture and then lateral anastomosis is performed. Professor Doyen also gave an account of his Operation for Congenital Dislocation of the Hip. The head of the femur was freed from its attachments, a new acetabulum was made by an ingenious circular chisel, and the head was replaced. A plaster splint was then applied by special apparatus. He mentioned that the operation had proved very successful.

Mr. E. MUIRHEAD LITTLE (London) read an interesting paper on Coxa Vara. He had found twenty-nine specimens in museums and mentioned that there were two varieties, one in children caused by rickets, and the other in youths, and caused probably by carrying heavy weights. He insisted on the very great value of Roentgen rays in diagnosing this condition, and showed by some skiagraphs how frequently other deformities are mistaken for coxa vara. He considered that the best treatment was subtrochanteric osteotomy.

Mr. NOBLE SMITH (London) described a case of excessive coxa vara for which he had done osteotomy with success.

OBSTETRICS AND DISEASES OF WOMEN.

FRIDAY, JULY 29TH.

The third day's session began with the reading of a paper by Dr. R. C. BUIST (Dundee) on

Two Symphysiotomies in Domestic Practice.

The two cases were offered as evidence of the suitability of symphysiotomy for domestic practice. The first case was that of a woman aged twenty-five years. Her first and second children died in labour, the second after difficult forceps extraction; the third died sixteen hours after induced premature labour. Pelvic measurements were as follows: 21·3, 25·2, and 32 cm.; diagonal conjugate 9 cm. At seven and a half months the pelvis was enlarged by Frank's method of chiselling an anterior lamella from the pubic bones. The absolute rest induced torpidity of the bowels and tympanites, and labour came on after a week. The eight months' child was easily delivered with forceps in the right occipito-posterior position. The pegs fixing the pubic bones dragged during labour and the wound broke down. Apart from a phlebitis progress was satisfactory; the patient was walking about in six weeks and was now well. The pelvis was firmly healed and had gained 2 cm. in its transverse measurement. The second case was that of a woman aged twenty years; a primipara, rachitic; pelvic measurements being 21·5, 23, and 29 cm.; diagonal conjugate 10 cm. After two days' labour and five hours after rupture of the membranes the child's heart sounds becoming weak and irregular, and there being no descent of the head, symphysiotomy was performed by Ayers' subcutaneous method, operation and delivery occupying less than an hour. The child was nursed from the first, and in less than three months the mother was at work. The child in the first case died from bronchitis at two weeks; the second was at present well and the head was nearly normal. As premature children in this social station were practically never reared the result must be deemed satisfactory.

Professor MORISANI (Naples) said that he had not invented symphysiotomy, but had remained faithful to it since 1863, when he read a short note on the subject at the London Congress. The point to remember about symphysiotomy was that it had no scope at all with a conjugata vera of less than 70 mm., for the utmost increase obtainable by symphysiotomy in this diameter was from 18 to 20 mm., which with 70 made about 90 mm.—i.e., about the diameter of the fœtal head. He proceeded to describe the method of operation which he adopted. Some used the open incision; he preferred a quite small incision from 2 to 3 cm., opening up the articulation sub-cutaneously. The risk of hæmorrhage was sometimes made much of, but it was quite exceptional. The operation was very free from after-pain; and if antiseptic precautions were good the results were excellent for the mother. As to the child, it might die during extraction; and here the question arose whether forceps should be used or the case left to nature. This treatment had an advantage over induction of premature labour, which often resulted in weakly children.

Dr. JOHN MOIR (Edinburgh) called attention to the satisfactory results which he had obtained from the induction of premature labour in cases of contracted pelvis; he thought this procedure was preferable to symphysiotomy.

Dr. AMAND ROUTH (London) read a paper on

The Treatment of Cystocele.

He divided cystocele into primary and secondary—primary, due to injury during childbirth, and secondary, due to prolapsus uteri, &c. Primary cystocele usually leads to supra-vaginal elongation of the cervix. The treatment depended upon whether the cystocele was primary or secondary. In all cases where retroflexion or prolapsus coexisted anterior vaginal fixation of the uterus was required. For the cure of the cystocele itself he considered that whatever the form of incision adopted in the performance of the anterior colporrhaphy, the essential part of the operation was the complete stripping off of the bladder from the front of the uterus and from the anterior vaginal wall. The bladder could then be turned up out of the way and the supra-vaginal part of the uterus fixed, if need be, to the anterior vaginal wall. In cases of primary cystocele with resulting supra-vaginal elongation of the cervix amputation of that structure was also required. Dr. Routh claimed no novelty for the steps of the operation which was practically involved in anterior vaginal fixation of the uterus, but in his paper he advocated its particular applicability to the cure of severe cases of cystocele.

Professor SÄNGER (Leipsic) said that for about eight years he had been doing an operation similar to that of Dr. Routh but more extensive. Having fixed the uterus and urethra with volsella, to expose the field of operation he made a median incision and reflected two vaginal flaps; into the exposed vesical wall one or more rows of buried silk sutures were inserted, after which the flaps were resected and the edges brought together with silk. It was almost always necessary to do a posterior colpo-perineorrhaphy at the same time because the perineum was always deficient in these cases. The mistake generally made, both with the anterior and with the posterior operation, was that they were not carried high enough.

Professor FEHLING (Halle) did not think that excision of a portion of the cervix was sufficient in these cases; it was necessary to do in addition a ventro-fixation or vesico-fixation of the uterus, otherwise there was a tendency to recurrence.

Dr. ARTHUR GILES (London) divided cases of cystocele into two classes, those in which the uterus was in normal position but the vaginal wall elongated and prolapsed, and those in which the cystocele was only a part of a general hernia of the pelvic floor. In the first kind, removal of a portion of the anterior vaginal wall might suffice; in the second kind, which was due to a separation of the vaginal wall from its pubic attachments during labour, removal of part of the vaginal wall would only have the effect of fixing the uterus in a low faulty position. The real desideratum was an operation which would restore the vagino-pubic connexions. Failing this, ventro-fixation combined with colporrhaphy answered best.

Professor MARTIN (Berlin), basing his remarks on an experience of over 1000 operations, advised repairing the defects of the uterus as well as of the vagina for the restoration of displaced pelvic organs. He first did an excision of the cervix, if necessary, then curetting; then anterior colpotomy was performed, which gave the opportunity of fixing the uterus up to 2 cm. over the internal os; this was quite safe in eventual pregnancy. Next an anterior colporrhaphy was performed, and at all events a posterior colporrhaphy must be added at the same sitting. The particular method employed seemed unimportant seeing that so many good results were obtained from different procedures.

Dr. LAPTHORNE SMITH (Montreal) emphasized the view expressed by Professor Sänger and Professor Martin that it was quite useless to do an operation for cystocele alone. His practice was as follows: (1) dilatation; (2) curetting of the uterus; (3) amputation of the cervix if necessary; (4) anterior colporrhaphy; (5) posterior colporrhaphy; (6) removal of diseased ovaries and tubes when

required; and (7) ventro-fixation of the uterus. All this could be done at one sitting; and if neither the operator nor anyone else talked could be finished in an hour and ten minutes. From this practice he had got very good results.

Dr. AMAND ROUTH, in reply, said that his main contention was that it was useless to attempt to cure cystocele unless the bladder was first completely stripped off from both the uterus and vagina and turned up out of the way. At the same time vagino-fixation could be effected if the uterus was displaced. It might be necessary to also amputate the cervix if supra-vaginal elongation had secondarily occurred. In primary uncomplicated cystocele he had found the operation he had described successful after two years.

Dr. W. J. SMYLY (Dublin) read a paper on

Extirpation of the Myomatous Uterus per Vaginam.

He said that the mere presence of a myoma was not an indication for operation, but in cases of small uteri which did require operation vaginal hysterectomy with morcellation was the best method in most cases. Out of the 17 cases in which he had extirpated the uterus in this way he had lost one in which the myoma had sloughed, and the patient died on the third day from septicæmia. The mortality, therefore, was 6 per cent.

Dr. THEODOR LANDAU (Berlin) held that in most cases it was not wise to wait too long before operating. The risks were: (1) sarcomatous degeneration of a simple myoma (of this he had seen three examples); (2) necrosis of the tumour owing to obliteration of the vessels by pressure, with resulting sepsis; and (3) exhaustion of the patient from loss of blood and consequent increased shock when it came to operation. It was a mistake to suppose that most fibroids became smaller at the menopause. He was pleased to find that Dr. Smyly was operating by the vaginal route and congratulated him on his results. If the surgeon wished to go in for a conservative operation and save the uterus, the vaginal route was well adapted for this and a speedy operator with thorough asepsis need not fear going on to do a ventral laparotomy if he were not able to finish by the vagina.

Dr. J. P. FARRAR (Gainsborough) read a paper on

A New and Speedy Method of Dilating a Rigid Os in Parturition.

He enumerated a series of cases on this subject of a very interesting nature. The new method was first brought to the notice of the profession at a meeting of the Obstetrical Society of London three years ago and the present paper was concerned with a detail of other fresh cases showing equally striking and remarkable results. Shortly, it was the application of a 10 per cent. solution of cocaine to the tin and unyielding os. In four minutes' time the physical change in the condition of the os was quite remarkable. Instead of a thin sharp margin—not unlike a piece of tin plate with a round orifice in it—the os became in four minutes' time widely open and as dilatable and distensible as a rubber bag.

Dr. JARDINE (Glasgow) had tried two-grain cocaine pessaries, but his results had not been very satisfactory. A solution might answer better.

Dr. ALICE KER (Birkenhead) spoke of the advantages of douches of very hot water in securing dilatation of a rigid os; they not only shortened the duration of labour, but also caused great diminution of the patient's sufferings.

Dr. A. DONALD (Manchester) read a paper on

Vaginal Section.

He gave the results of 60 cases in which he had opened the peritoneal cavity or operated for diseased conditions of pelvic organs by means of vaginal incision. The cases were classified as follows: exploratory incision, 18 cases; incision for pelvic abscess, 11 cases; incision for ectopic pregnancy, 8 cases; vaginal ovariotomy, 20 cases; and vaginal myomectomy, 3 cases. In 30 cases the incision was made in the anterior fornix and in the remaining 30 it was in the posterior fornix. Gauze packing or drainage was used in 25 cases. There were 2 deaths directly due to the operation, a mortality of a little over 3 per cent. The various conditions which might be treated by vaginal section were discussed in detail. The advantages of vaginal over abdominal section were summarised as follows: (1) absence of shock; (2) less risk of septic peritonitis; (3) quicker recovery and less troublesome convalescence; (4) avoidance of abdominal scar; (5) more perfect drainage; (6) better control of oozing of blood from pelvic cellular tissue or peritoneum; and (7) simplicity of procedure in some cases. All these points were considered in detail. The objections to the operation were then discussed. Narrowness of the vagina and pelvic adhesions occurring together formed a contra-indication to the operation, but either of these singly did not necessarily render vaginal incision very difficult. Mere bulk of a tumour, so long as it is cystic, was not a contra-indication, but a large tumour with adhesions at its upper portion could not be dealt with by vaginal section. The troublesome after-effects which were said to ensue through weakening of the pelvic floor had not been observed in any of Dr. Donald's cases.

Dr. W. E. FOTHERGILL (Manchester) contributed a paper on

The Function of the Decidual Cell.

Whilst investigating the ultimate fate of placental tissue retained *in utero*[1] Dr. Fothergill observed appearances which led him to believe that under certain conditions the enlarged connective tissue cells of the uterine mucosa—namely, the decidual cells—had a phagocytic action upon the fœtal epithelium covering the chorionic villi. The connective tissue cores of the villi also appeared to be destroyed by decidual cells, but much more slowly than was the chorionic epithelium. This action of the decidual cells under morbid conditions suggested to him that under normal conditions also the decidual cells might have a destructive action upon certain fœtal structures. He therefore examined a number of specimens of decidual and placental tissues obtained under circumstances as normal as possible in the hope that the above-mentioned pathological action of the decidual cells might afford a clue for the discovery of their physiological action. Villi which penetrated the decidua serotina were found to be without epithelium or to show only traces of it, while they were, as a rule, surrounded by numerous decidual cells; indeed, the tips of villi which had reached to and entered the surface of the decidua were found in all stages of disappearance, the stroma shrinking and vanishing more slowly than the epithelium. Sections cut through the membranes so as to show amnion, chorion, and decidua showed similar appearances. Those chorionic villi which were not in contact with decidual tissues retained their epithelium in a degenerated condition, while those embedded in the decidua were entirely without epithelial covering, the stroma also in many cases being reduced to a mere trace. Dr. Fothergill pointed out the importance of careful microscopic examination in every case in which the pregnant uterus was removed by operation, the main difficulty in settling questions of placental structure and function being the rarity of healthy specimens from the early months of pregnancy. It was generally admitted that at an early stage of development the chorionic epithelium had a destructive action upon the surface of the decidua. Dr. Fothergill's observations pointed to the conclusion that the decidual cells had in their turn, at certain stages of development, a destructive action upon fœtal structures. Thus in the formation of the placenta and membrane there occurred what may be broadly described as a struggle between fœtal and maternal elements which resulted in the destruction of both in considerable degree. The relation might be expressed in intelligible though somewhat inaccurate form by saying that the fœtus was a parasite and that the decidual cells prevented it from being an injurious parasite by attacking those fœtal structures which penetrated the maternal ones enclosing them. Viewed in that light invasions of the maternal organism by fœtal elements would be regarded as due to a failure to perform their duty on the part of the decidual cells. Dr. Fothergill's hypothesis thus possessed a general pathological interest as bearing upon the origin of certain neoplasms, besides giving an explanation of the existence of the decidual cell.

Dr. A. LAPTHORNE SMITH (Montreal) read a paper on

The Best Operation for the Cure of Displacements of the Uterus.

The conclusions to which he had come in his paper were based first upon his own personal experience of 111 ventro-fixations and 89 Alexander operations; secondly, upon the experience of 40 first-class operators, all Fellows of the American Gynæcological Society, who had had among them about 2500 ventro-fixations or suspensions of the uterus; and thirdly, upon his recent visit to the leading gynæcologists of Europe,

[1] Brit. Med. Jour., Jan. 29th, 1898.

whom he had seen performing vaginal fixation. His own experience with Alexander's operation was all that could be desired. There was no difficulty in finding the ligaments, no hernia, only one relapse, and no trouble in subsequent labours. With ventro-fixation the cases had been much more severe, because he had only done it when there were diseased tubes causing fixation of the uterus. One patient had died; 1 had relapsed; 1 had a hernia; 2 had had miscarriages, and 3 had had normal labours; in 7 cases a buried stitch had required removal subsequently. Out of the cases reported by other operators above mentioned there had been 146 pregnancies, in 36 of which there had been pain, miscarriages, or difficult labour requiring obstetrical operation, and two or three women had died. Most of these operators had abandoned fixation and now performed suspension by stretching round ligaments to the abdominal wall. As a result, however, of what he had recently seen on the continent he would now abandon both Alexander's operation and ventro-fixation and treat all these cases in future by vaginal shortening of the round ligaments which had the following advantages: (1) it was very easy; (2) it could be done very quickly; (3) it should have no mortality; (4) it was free from subsequent pain; (5) it would do as well for cases of retroversion with fixation as for those in which the uterus was freely moveable; (6) it did not interfere at all with subsequent labour or pregnancy; and (7) it did not leave any painful wound or unsightly scar, women being more willing to have an operation in the vagina than on the abdomen.

Mr. CHRISTOPHER MARTIN (Birmingham) read a paper on

The Conservative Surgery of the Ovary.

He pointed out the physiological value of the ovaries and urged the importance of saving even half an ovary in certain pelvic operations. In cystoma affecting only one ovary the other should not be removed. In sarcoma of one ovary, however, both should be removed. In inflammatory disease of the appendages on one side it was unnecessary to remove both sides. In cases of double pyosalpinx the diseased tubes with the uterus should be removed *per vaginam*, but one or both ovaries should be left behind. The section of the ovary was advised in some cases of fibroma, dermoid tumour, and cystic disease of the ovary. In cases of chronic and cystic ovaritis ignipuncture was recommended. In cases of parovarian cyst and cyst of the broad ligament the cyst should be shelled out of the broad ligament and the ovary preserved. Lastly, in cases of vaginal or abdominal hysterectomy one or both ovaries should be left behind.

STATE MEDICINE.

WEDNESDAY, JULY 27TH.

Dr. MACMARTIN CAMERON (Newton-Stewart) read a paper on

Surface Wells as a Source of Water-supply.

The Rivers Pollution Commissioners hold up the shallow or surface well to execration. In respect of wholesomeness, palatability, and general fitness for drinking purposes they form the time-honoured classification of potable waters into wholesome, suspicious, and dangerous, ranging from spring water in the top place to shallow well in the bottom place. But there are shallow wells and shallow wells—good, bad, and indifferent. He (Dr. Cameron) did not defend cesspools such as the Commissioners had in view, where the best title to the name of well consisted in the possession of a pump. Fortunately, such wells were less in evidence now than formerly. Subsoil water laboriously pumped or lifted by buckets from wells is being fast replaced by upland surface water distributed by gravitation. The main purpose of that paper was to ask whether that drastic and in most cases costly change was altogether reasonable, more especially when thrust upon unwilling and impoverished communities. It was only in the hope of eliciting the views of others that he had acted on the assurance of his friend Professor Hunter Stewart that such a subject would be likely to give rise to an interesting discussion. Reverting to the old classification of potable water Dr. Cameron maintained that the proper place of surface well water, if reasonably safeguarded, should be in the "wholesome" list, and that the list should read, "spring water, deep well water, upland surface water," with the addition of surface well water either before or after the third of those names. Everything depended on where the wells were situated and how the surroundings were protected. The fourth place on the Commissioners' table was allotted to "stored rain-water," but they would not have arrived at that conclusion solely from an inspection of backyard water-butts, with their customary mass of pollution. To place surface well water below that from cultivated lands was to neglect the essential difference between those waters—namely, that the well water underwent a more or less prolonged ground filtration. That fact was strongly insisted upon by Dr. Vivian Poore, the champion of surface wells, who maintained that contamination of such wells has always resulted from direct inflow of pollution from the neighbouring ground or by cesspool or sewer subsoil leakage. In some cases a farm is supplied with drinking water from a well in the centre of a pasture-field, and everything goes well. If, however, the field is then ploughed up and manured then the well becomes polluted. The danger arises when the turf is destroyed and an easy way made by the plough for the direct influx of polluting matter into the pipes or into the well itself. In two instances he had traced outbreaks of typhoid fever to the breaking up of the soil in that way. It is no uncommon thing for farmers to spread manure and dig potatoes on the very tops of these wells. In no single instance had he traced typhoid fever to any surface well situated in a decently clean locality. Typhoid fever was rare in his district, notwithstanding the fact that it contained outside the town a population of 40,000 or 50,000 persons dependent on surface wells. There appear to be an unreasonable distrust of surface wells and a blind faith in gravitation water. In the latter great attention was always bestowed on the sources, whereas surface wells are often placed in bad sites and under the worst possible conditions. Curiously enough, it is not uncommon to find a surface well yielding a pure water although uncased and exposed freely to contamination. With the approval of the Local Government Board a village in the county of Wigtown containing a population of nearly 1000 inhabitants will shortly be supplied with water from new surface wells dug in clean ground outside the village to replace polluted ones within. The alternative was a supply by gravitation from a burn three and a half miles away, a plan which would have entailed five or six times as much expense.

Professor HUNTER STEWART (Edinburgh) remarked that Dr. Vivian Poore's experiment with a 6 ft. well carefully cemented at the sides gave water which contained 7 micro-organisms to the cubic centimetre and bacillus coli was conspicuous by its absence. A part of the supply of the city (Edinburgh) was from wells near the Pentland Hills not more than 8 ft. deep, situated in highly manured land and exposed to pollution from neighbouring middens. From the water of these particular wells of a maximum of 8 ft. in depth he found a maximum of micro-organisms of 11 to the cubic centimetre and a minimum in 3 out of 8 wells of absolute sterility. These observations abundantly supported the observations of Dr. Poore.

Dr. NASMYTH (Cupar) said a surface well might be pure for instance on a hill side, but on the other hand it might be fouled. It was not the well but the circumstances which must be considered. The well would be right enough if we could get a pure zone round it.

A paper was read by Dr. R. SYDNEY MARSDEN (Birkenhead) on

Filaria Strongylus or False Tubercle in the Pig, Sheep and Goat.

This is a zoo-parasitical disease of frequent occurrence in the animals mentioned. Its description, however, was not to be found in any text-book on meat inspection. Dr. Marsden believed that lungs so affected were constantly seized and condemned as tuberculous. On examination the affected lungs might be slightly congested or even appear normal. The surface was covered with small light-brown or grey patches of from the size of a pin's head to that of a pea in the midst of small zones of congestion. The patches formed little raised tumours or granulomata resembling those of tuberculosis, but softer and more hyaline. They were scattered through the lungs and formed growths in section of the size of a farthing or a halfpenny. On taking them between the finger and thumb they were less firm and resistant than tubercle, and their size was not so great as a rule. On section they looked like tubercle with their hyaline grey appearance and the opaque yellow of their older and retrograde stages. On passing the finger over these growths a gritty feeling could be detected much resembling that of tubercle,

but less harsh. They appeared to be formed wherever an egg of the strongylus was arrested and became the centre of a granuloma. The structure exactly resembles that of tubercle—namely, giant cells, epithelioid zone, and small-celled external zone, but the distinguishing feature was the presence of one or more ova. The commonest sites of infection were the lungs, kidneys, and liver, and the best description of the disease is that given by Professor Boyce, its discoverer. As a practical conclusion Dr. Marsden pointed out that affected organs should be seized and destroyed, but the flesh of the animals was not affected. There was no emaciation and the brightness and "setting" qualities of the meat were not altered.

Dr. J. MCNAUGHTON (Australia) then read a paper on

An Epidemic of Typhoid Fever in Wimmera District, Australia.

The Wimmera district, north-west of Victoria, Australia, in 1893 suffered from an epidemic of typhoid fever. The water-supply was obtained chiefly from rain-water and ground tanks. Reservoirs were formed by impounding streams which supplied the tanks by gravitation. In 1888 Dr. McNaughton reported enteric fever to the authorities for the first time. At first the cases were mild but became more serious as the epidemic progressed. The chief preventive method was that of destruction by fire of all infective material.

THURSDAY, JULY 28TH.

By previous arrangement the Section of Psychology joined the Section of State Medicine in discussing two subjects.

Sir WILLIAM GAIRDNER, K.C.B., opened the debate on

Aphasia in Relation to Testamentary Capacity.

He said that aphasia had been little regarded from the physiological point of view, although from a clinical standpoint it reckoned an enormous literature. Besides Broca's convolution there were at least four other centres concerned in speech, to say nothing of a fifth or "ideation" centre, the location of which is still obscure. He would concede that a man who had never been otherwise than aphasic could never reach a higher level of reasoning than that of the dog or the horse, when a man became aphasic by accident, "lamed," as it were, theoretically he suffered some damage to his already developed reasoning faculties, but he was not prepared to admit that he suffered any derogation to his higher faculties. Pasteur had a right-sided lesion and made the short will, "I leave all my goods to my wife." Was his mental capacity diminished, or if the lesion had been on the left side would his will have been less valid? His (the speaker's) own view was that the existence of aphasia interfering with graphic or auditory speech threw the *onus probandi* upon those who wished to prove the genuineness of the will.

Dr. ELDER (Leith) believed an aphasic was necessarily on a lower mental and intellectual level, and in answer to a question said he believed Pasteur came under that general rule. It was difficult to say precisely where testamentary capacity ended. If the auditory centre were destroyed a person was unfit to make a will. Destruction of the graphic centre did not disqualify; the difficulty there was the legal formality; simple infra-pictorial visual and infra-pictorial motor aphasics are capable of valid will-making. In certain contingencies a will might be drawn up by "mirror-writing."

Dr. CLOUSTON (Edinburgh) said a vital point was whether the will was that of the patient or had been suggested to him. Aphasic patients would assent to anything, but it was the duty of a doctor invariably to put the alternative case to the aphasic testator.

Dr. MERCIER (London) opened the second subject by a paper on

The Plea of Insanity in Criminal Cases.

Medical men had no standard as to the mental condition which should exonerate a criminal from punishment. On the other hand, the principle was accepted that insane persons should not be punished with a severity equal to that inflicted upon the sane. While every insane person might commit offences for which he ought not to receive punishment, yet there were very few lunatics who were wholly irresponsible. He advanced the propositions that it was right and just to punish the insane for wrong-doing, and that to a greater or less extent that view was acted upon in every asylum, either directly or by the withdrawal of privileges. He urged medical witnesses not to shrink from asking total immunity for some criminals and partial immunity with mitigated punishment for others. To establish a plea of insanity proof of one or more of the following mental conditions should be demanded: delusions; such confusion of mind that the accused was incapable of appreciating in their true relations the circumstances under which the act was committed or the consequences of the act; marked inadequacy of motive; extreme recklessness and the non-concurrence in the act of the volitional self.

Dr. J. F. SUTHERLAND (Lunacy Commissioner, Scotland) said that in Scotland there was no desire among experts for an alteration in the law. He did not know any case in which injustice had been done where the plea of insanity had been advanced, but he knew instances of grave injustice where the offender was intoxicated. If any alteration of the law were required it was not as regards the delusional man but the intoxicated man who committed a crime of which he had little or no recollection. Intoxication was insanity of the purest kind and the habitual drunkard was not a voluntary drunkard. Such persons should not suffer for their crimes, although within the past five years in Scotland one such person had been executed.

Dr. BLANDFORD (London) urged that a lunatic's knowledge of right and wrong was that of an insane person, comparable to the recognition of the same kind by a child or a dog.

Professor GLAISTER (Glasgow) thought that the tendency was to do injustice not so much to insane persons as to the general public.

Sir WILLIAM GAIRDNER agreed with Dr. Mercier's propositions. To the two existing verdicts of "Guilty" and "Not guilty on the ground of insanity" he would add a third—"Guilty but insane."

Dr. MERCIER pointed out that there was another verdict in England—"Guilty, but strongly recommended to mercy"—which always influenced a court of law.

Dr. NASMYTH (Cupar) introduced a discussion upon

The Hygienic Control of Milk Supplies.

He first gave a summary of existing laws and of the systems in force in foreign countries. In view of the recommendations of the Tuberculosis Commission we might hope for better regulations. Legislation in Scotland was ahead of that in England since the Act of 1897 was passed and the notification of infectious disease became universally applicable to Scotland. It was now possible to localise outbreaks of infectious disease spread through the agency of milk and to take steps to prevent further spread. The great questions for the future were tuberculosis with reference to meat and milk and how the owners of tuberculous animals were to be compensated. The use of sterilised milk until tuberculous cows were eliminated was almost a necessity. The Legislature ought to take into account the fact that British farmers were forced to compete with dairy products produced in many instances under lax conditions. The home farmer might readily be placed in harassing competition with Danish and other producers who were not hampered with regulations.

Dr. SPOTTISWOODE CAMERON (Leeds) pressed strongly upon the Section the desirability of a sort of right of search or examination of milk farms even outside the city boundaries by the medical officer of health of the town into which the milk was brought. Enlargement of boundaries, to include largely the contributing farms, did something. Farms outside the borough might be as dirty as possible, but medical officers of health, although of course they visited such farms, yet had no right to do so. The authority should be able to act rapidly in the case of suspected dairies. In Leeds every infectious case was at once entered opposite the name of the supplying dairyman.

Sir CHARLES CAMERON (Dublin) said that twenty years ago he traced an extensive outbreak of typhoid fever in Dublin to the milk-supply. Recently they had ascertained the names and addresses of workers in dairies. The personal hygiene of such persons was insisted upon by such means as washing the hands and wearing blouses. The hawking and the storage of milk in rooms they attempted to check by registration. Compensation was given where milk was destroyed. Dairies should not be allowed to exist in crowded parts of towns.

Professor FORSTER (Strasburg) said that many pathogenic organisms could be killed by one minute's exposure to a temperature of 150° F. The bacillus typhosus was destroyed

by fifteen minutes' exposure to the same temperature, which did not spoil the flavour of the milk.

Principal DEWAR (Edinburgh) maintained that byres should be distinct from dairies or milk-houses. Scotch farmers would be willing if Government would offer full compensation to stamp out tuberculosis as they had done rinderpest. He did not imagine that any plan of notification of disease in animals would meet with any full results. He thought that the periodical inspection of dairies by veterinary surgeons must follow upon the reports of the Royal Commission.

Professor AITKEN (Edinburgh) advocated the use of milking machines which avoided the exposure of milk to air and to dirty hands. The personal hygiene of the workers should be looked after. Contamination of milk was in the main due to uncleanliness of environment of the milkers and their efforts should therefore be turned in those directions. It would be practical to have milking stalls close to, but separate from, the byres, fully exposed to light and kept perfectly clean. In such a place one would be able to obtain all the accompaniments which would enable milkers to extract the milk with the least contamination from air and other sources.

Dr. CHALMERS (Glasgow), without suggesting any doubt of the value of sterilising milk, raised a query as to its value as a recommendation to the general consumer. If, on the one hand, the consumer was told that by general control a pure milk-supply could be maintained was he not more likely to insist upon that being accomplished than by trusting to pasteurising which assumed an impure supply? With regard to the recommendation of the Tuberculosis Commission that certain diseases should be notified he thought affections of the teats should be included. In presence of so many unrecognised varieties of infectious disease he advocated the notification by the dairyman of all diseases whatever in the persons of his workers.

Dr. JOHN ROBERTSON (Sheffield) then read a paper on

Soil as a Factor in the Spread of Certain Diseases.

The renewed interest in soil as a factor in the spread of disease recalled the attention early given to that point by Budd, Simon, Buchanan, and others. With Dr. Gibson he had noted an upward growth towards the surface in bacillus typhosus. He had been led to believe that during the winter months the organism disappeared from the surface and remained sheltered in the deeper layers until it sallied forth again in the warmer season. From an examination of many yearly mortality maps some years ago he concluded that the disease constantly prevailed at a high rate in some districts and a low one in others. He had published elsewhere the observation that the typhoid organism died out during the cold months except when the soil was artificially fed with organic matter. That, in his opinion, explained to a great extent the local prevalence of enteric fever. The attention paid to the water-carriage of typhoid infection seemed to have distracted attention unduly from other methods of infection. He felt certain that dust was the chief agency in conveying the infection to man from the soil. The relative heaviness of bacteria was inferred from certain observations and experiments. If true, this fact goes far to explain why only persons coming within a certain area are affected, for it presupposes that such heavy particles will not travel great distances and is a further argument against aerial spread.

Dr. NEWSHOLME (Brighton) pointed out the extreme value of Dr. Robertson's experiments because they were carried out under natural conditions in the open field and not on sterilised earth.

FRIDAY, JULY 29TH.

Dr. REID (Stafford) presided in the unavoidable absence of Sir HENRY LITTLEJOHN.

Dr. F. T. BOND (Gloucester) opened the discussion upon

Vaccination, with Special Reference to Prospective Legislation.

There was no need, he said, in such an assembly to assume that all were convinced that vaccination was in some degree a protection against small-pox. Further that when properly performed it was free from serious risk, and that it was nearly, if not quite, as efficient a protection as an attack of the disease itself. In all legislation they must face facts and allow for differences of opinion. They had a right to ask Government to provide for revaccination, about which the present Bill was absolutely silent. There need be no question as to compulsory revaccination if a conscience clause were inserted. A parent objecting to have a child vaccinated at six months of age should have the opportunity of going before a court when the child was four months old to satisfy the justices of a conscientious objection. Any penalty then would be not for neglecting vaccination, but for failing to register the objection; and so it might be with revaccination. When an unvaccinated child, aged four or five years, was about to enter school the parents should attend a court and reassert the objection and again at the age of twelve years, acting on returns that could be obtained from the School Board. Parents who objected to having an infant vaccinated might consent in the case of grown children. These three attempts, however, would leave a certain percentage of unvaccinated cases, as would happen in this democratic country under any system. He suggested that private practitioners should be obliged to bring their standard up to that of the Local Government Board. Inspection might take the form of a few surprise visits and a prosecution here and there if necessary. Under the present Bill the sanitary authority would have as little power as now to promote vaccination and the medical officer of health would continue to have neither responsibility for, nor official connexion with regard to, one of the most important branches of his sanitary work. At the same time he (Dr. Bond) thought that there should be a public prosecutor to take up cases, which should be done judiciously. The Vaccination Bill was one of many illustrations of the increasing unfitness of Parliament, with its present antiquated regulations, to deal with the legislative requirements which the ever-augmenting complexity of our social organisation demanded.

Dr. MONCKTON COPEMAN (London) said that his experimental work, which was now accepted by the Government, had been in connexion with the purification and preservation of vaccine lymph. The use of glycerine was originated by an Englishman, W. Cheyne, in the year 1854, and was employed by Dr. Stephen Mackenzie and others during the epidemic of 1870–71, with the intention merely of increasing the stock of available lymph. He found large numbers of extraneous organisms in samples of human, and particularly in calf, lymph, some of them being indistinguishable from forms capable of setting up suppuration. In the course of work on the bacteriology of vaccine lymph he discovered a means of freeing lymph from such organisms. After many experiments he found that glycerine had the power of killing out those extraneous organisms after a certain definite time and if used under certain definite conditions, while at the same time the efficiency of the lymph was uninjured. It was proposed to use lymph only which had been shown by the method of plate cultivation to be free from micro-organisms. In the future possibly something better than glycerine might be found. At present when rightly used it was the only substance which was capable of giving results of value in the purification of lymph. Unfortunately vendors were now selling "glycerinated" lymph which did not answer to his own definition of a carefully tested and aseptic vaccine lymph.

Dr. NEWSHOLME (Brighton) hoped for the withdrawal of the Bill for a time in order to get a fuller expression of popular opinion. He moved the following resolution:—

That in the opinion of this Section the Vaccination Bill before Parliament should be withdrawn in order that the Government might have the opportunity of fully considering the views and facts which have emerged in the discussion upon the Bill on the part of the profession and the public and that a new Bill should be introduced next session.

Dr. C. R. DRYSDALE (London), in seconding the resolution, held that vaccination and revaccination should be carried out by animal, and not by humanised, vaccine. During the last century small-pox was a children's disease and rarely killed adults. Nowadays in this country it was fatal almost entirely in adults over the age of twenty years. Since 1875 Germany had vaccinated every infant and revaccinated every child before the age of thirteen years. The success of that experiment was shown by Gerhardt, who wrote in 1896 that the disease had almost died out in Prussia.

Dr. G. C. FULTON (Middlesboro') and Dr. C. SMITH addressed the meeting and Sir WILLIAM PRIESTLEY announced that the Bill would come before the House on the following day (Saturday).

The resolution was carried and copies were directed to be sent to the leaders of both Houses of Parliament and to Lord Lister.

Sir CHARLES CAMERON (Dublin) in opening the discussion on Dr. J. Robertson's paper on

Soil as a Factor in the Spread of Certain Diseases,

said that in Dublin a close relationship existed between the soil and the existence of typhoid fever.

Sir RICHARD THORNE (London) remarked that two years ago he asked the Government to take steps in that direction because of the constant recurrence of typhoid fever when it had once entered any particular spot. Experiments showed that the bacillus typhosus flourished well in soils which contained the bacillus coli but infinitely better in the presence of bacillus enteriditis sporogenes. He hoped that the question of tuberculosis and soil would be investigated. He trusted that in this country they would never fall into the error of regarding the bacteriological laboratory as the *summum bonum* of public health work. Much of our best preventive work had been effected in pre-bacteriological days. Bacteriology was a precise and scientific science, but it was by its practical application that the medical officer would hold his own.

Dr. H. SCURFIELD (Sunderland), who came from a town in which typhoid fever was very prevalent, had noticed how year after year the disease had clung to infected houses.

Dr. F. J. ALLAN (London) read a paper on

Formaldehyde and Sulphur as Disinfectants,

which contained the following conclusions:—1. Sulphur dioxide killed the diphtheria bacillus easily, the shortest exposure being 4½ hours to air in which 1 lb. of sulphur per 1000 cubic feet had been burned. Cholera bacilli were killed in the dry state in air by the combustion of 2½ lb. of sulphur to 1000 cubic feet. Anthrax and typhoid fever bacilli were not killed by this gas. 2. Formic aldehyde. Trillat's autoclave proved unsatisfactory. The Alformant lamp gives good results and kills diphtheria and typhoid fever organisms, moist or dry, after 6 hours in air charged with 10 "paraforms" per 1000 cubic feet.

Dr. KENWOOD (London) was glad to hear that Dr. Allan's experiments agreed with his own. One important fact was that if the Alformant lamp was to be effectual it would be necessary to employ more of the paraform tablets than were recommended by the manufacturers. He found that ten "paraforms" simply inhibited organisms of slight resistance. He concluded that twenty-five should be used per 1000 cubic feet to ensure disinfection.

Dr. LESLIE MACKENZIE (Leith) stated that for over two years he had used formalin spray and that he had ceased to use gaseous disinfection because he found that the spray was more simple and more rapid. He had disinfected many houses for various infections and never in one single instance had he found any case traceable to the disinfected room. The chief practical objection that at first caused him to delay the adoption of the spray for general disinfection was its possible effect on walls and wall-papers. He exhibited specimens of variously coloured papers which had been pasted on boards and then sprayed to saturation. None showed the slightest damage.

Dr. F. A. DIXEY (Oxford) read a paper on

Diphtheria in London.

His main conclusions were that the interruption to the usual course of diphtheria mortality coincidently with the two chief school holiday periods was apparent both in 1896 and 1897. This tended to confirm the importance of school infection. A considerable number of cases were still returned as croup. The marked diminution in the case mortality which began in 1894 had been maintained and was coincident with the introduction of the treatment by antitoxic serum.

Dr. MILLARD (Birmingham) read a practical and interesting paper on

"Return" Cases of Scarlet Fever.

Sir CHARLES CAMERON, chief medical officer of health of Dublin, read a paper on

The Incidence of Private Improvement Expenses in relation to Rack-rent.

He pointed out that the improvements in the sanitary conditions of houses involving structural alterations had to be paid for by the immediate rack-renter. This rent was defined in the English Public Health Act to be the bare rent of premises, minus the sum necessary to keep the premises in repair and some other deductions, the whole to be determined by the Court. The Irish definition was more simple and was a better one—namely, two-thirds of the valuation of the premises for rateable purposes. If a house was valued at £90 a year and was let at £60, then the latter was a rack-rent. Sir Charles Cameron pointed out that it was often unfair that the person who received a rack-rent should pay the cost of the improvement. He might have let the house on a lease for ever, or he might pay a rack-rent greater than the rack-rent which he himself received. He quoted the case of a man who let his house for twenty-one years and who eighteen years afterwards became the yearly tenant of his own tenant. He complained of the bad drainage of the house and on the sanitary authority intervening the immediate rack-renter was obliged to pay the cost of improved drainage and sanitary accommodation, though in three years the house would revert to the present yearly tenant. After describing several cases of injustice Sir Charles Cameron suggested an amendment of the law so that all the persons having an interest in sanitary improvements should contribute proportionately to the cost.

Dr. H. SCURFIELD (Sunderland) then read a paper on

The Necessity for the Amendment of Part I. of the Housing of the Working Classes Act, 1890.

He thought that Part I. of the Act would be of much greater value if the preliminaries of a scheme were simplified and powers were given to the local authority to decide on the type of buildings which were to be erected on the "unhealthy area." At present the preliminaries were so drawn out as to exhaust the energies of the most ardent sanitary reformer. In Sunderland it was proposed to deal with an area of about half an acre, with 480 inhabitants. A representation was made by the medical officer of Health in August, 1893. The scheme was completed and advertised in October, 1893, and forwarded in November to the Local Government Board, who held an inquiry in January, 1894, and issued a provisional order in May, 1894. In September, 1894, the same board held a second inquiry. In 1896 the purchase of properties was so far completed as to warrant an advertisement for designs for workmen's dwellings. The prizes for that competition was awarded in January, 1895. The accepted plans were then slightly amended and provisionally approved in March, 1897. Various transactions with the Local Government Board, including an extension of the original scheme, ended in a deputation to the latter in December, 1897. Further amendments were approved by the council and were forwarded in February to the Local Government Board, who asked for further plans, which being approved they ordered a further local enquiry in July, 1898. Four years and eight months had thus elapsed since the original petition was made, and there was still no prospect of an early start. Dr. Scurfield advocated an amendment of the Act by leaving the kind of buildings to be erected to the discretion of the local authority, and by simplifying and shortening the preliminaries of such improvement schemes.

Resolutions.

Dr. M'LEAN WILSON (Wakefield) proposed the following motion:—

That in the opinion of this meeting (1) further legislation for the prevention of river pollution is urgently required, lengthened experience having shown that the Act of 1876 is in many respects defective; (2) that the Bill at present before Parliament is insufficient and unsatisfactory; and (3) that the parliamentary Bills Committee of the British Medical Association should take action in the matter.

Dr. ALFRED HILL (Birmingham) seconded the motion, which was adopted.

Sir CHARLES CAMERON proposed a second motion which was as follows:—

That in the opinion of this Section a standard percentage of fat should be fixed for milk, but it should not go so far as to say what that percentage should be.

Dr. ALFRED HILL seconded the motion and it was adopted.

Dr. SCURFIELD proposed the following motion:

That it be a recommendation to the Council that in future meetings of the Association there be a separate section for public health.

Dr. KENWOOD seconded the motion, which the section adopted.

A vote of thanks was then passed to the President, Sir Henry Littlejohn, and the proceedings came to a close.

NEUROLOGY.

FRIDAY, JULY 29TH.

Demonstration of Specimens.

The meeting on this occasion was devoted to the demonstration of specimens.

The first was by Dr. I. C. DUNLOP (Edinburgh) and Dr. GEORGE MACKAY (Edinburgh) to illustrate the condition found in the Brain of a patient who had suffered from Defect in Colour Vision.

Dr. JAMES TAYLOR showed with the lantern specimens

illustrating the Changes in the Spinal Cord associated with Anæmia and Allied Conditions.

The PRESIDENT showed Photographs of the Brain of a patient who had lost the Naming Faculty.

Dr. A. W. CAMPBELL also demonstrated with the lantern various interesting Conditions occurring in Brain and Spinal Cord, among others the sclerosis found in some cases of anæmia.

Dr. E. F. TREVELYAN (Leeds), Dr. MICHELL CLARKE (Bristol), Dr. A. BRUCE (Edinburgh), Dr. R. A. FLEMING, and others also showed collections of very interesting pathological specimens.

PATHOLOGY.

THURSDAY, JULY 28TH.

Dr. HERBERT E. DURHAM (London) read two papers on: (1) an Inquiry into an Epidemic caused by a Variety of the Bacillus Enteriditis of Gärtner by Means of Sero-diagnosis (Gruber's Reaction) and Bacteriological Examination; and (2) on a Simple Method of Demonstrating the Formation of Gas by Bacteria.

Dr. LAZARUS-BARLOW (Cambridge) read a paper on Irritation of the Pleura and Pleurisy and showed a number of lantern slides in illustration of his results.

Professor GREENFIELD (Edinburgh), Dr. WOODHEAD (London), Professor MCFADYEAN (London), Dr. MUIR, and Dr. D. A. WELSH (Edinburgh) criticised the paper, and Dr. LAZARUS-BARLOW replied.

Dr. DURHAM then opened a discussion on

The Agglutinating or Sedimenting Properties of Sera and their Relation to Immunity.

He said that the importance of the agglutinating principle had been greatly enhanced by the observation that the blood serum of typhoid fever patients might acquire the property of clumping cultures of the typhoid bacillus. This observation was first made in the Hygienic Institute of Vienna by Dr. Grünbaum working at the suggestion of Professor Gruber. As the known varieties and species of bacteria were steadily increasing it became more and more difficult to find criteria by which the different kinds might be distinguished. The principle of specific immunity thus became of the greatest importance and might be applied in three ways: (1) in respect of the protective power of a serum; (2) in respect of its lysogenic power; and (3) in respect of its agglutinative power. Many writers have denied the existence of any relation between agglutinative and protective action, and it was well known that certain forms of protective sera had no agglutinating power—e.g., diphtheria antitoxin serum. Agglutinating properties were therefore not essential to protective sera. The problem, however, was rather in the opposite sense—viz., whether the agglutinating property was always associated with some degree of protective power. Pfeiffer endeavoured to discredit the existence of any relation between these two properties on very insufficient grounds. He found that several months' after a Haffkine cholera injection the agglutinating power had fallen to the level present in many normal sera, while the protective power was still considerably increased. His results showed that a complete lysogenic action occurred only in those cases in which a dose of serum approaching the limit of clumping effect was given; unfortunately the condition of the vibrios immediately after injection was not stated. His other experiments with old sera merely showed that low protective and destructive (lysogenic) powers were associated with low clumping power. Pfeiffer's test reaction was not necessarily associated with a complete protection. In reality the destruction of the bacteria introduced was only partial at the end of the time limit, for if the animal be killed when all the organisms in the peritoneal fluid were degenerated numerous untransformed individuals were found on the omentum. In all probability the previous agglutination of the bacteria was an important factor in the production of the degenerative process in the free peritoneal fluid. According to Dr. Durham's own observations on sixteen different vibrios a positive Pfeiffer's reaction (lysogenic properties), a complete sedimenting effect and permanent protection were invariably associated. Other observations made by Dr. Durham on the action of sera obtained from patients in an epidemic associated with the presence of a variety of the bacillus enteritidis were in harmony with the view that protective and lysogenic properties were associated with agglutinins. It was interesting to note that even with a non-pathogenic organism an agglutinative serum might be obtained. Thus after injection of the bacillus megatherium a serum might be obtained which had the power of sedimenting this bacillus and typical degeneration occurred when tested by Pfeiffer's method. The question arose whether there was any evidence of a proportional relation between the protective and the clumping power of a serum. It was essential to note that the less virulent races of vibrios were more susceptible to the agglutinins produced by the use of virulent varieties than were the virulent varieties themselves. Moreover, the serum obtained by means of the less virulent, though highly effective on them, had slight influence on the more virulent kinds. Again, everyone who had watched the process of agglutination under the microscope must have observed that some individuals were affected long before others, while a few might escape altogether. If, then, the agglutinating power of a serum be measured by the limit dilution at which a visibly recognisable effect was produced in a given time we got some idea of the action upon the susceptible individuals, but the resistant and less susceptible organisms were not heeded. Hence in contrasting the protective and clumping efficiency of sera we must take into account the effect produced upon the more resistant as well as that upon the more susceptible individuals. When bacteria were grown in the presence of even small quantities of efficient agglutinating serum they exhibited departures from their normal habit of growth—e.g., the reducing power of a cholera vibrio might be checked, the phosphorescence of a luminous vibrio might be stopped, the production of the pigment pyocyanin by the bacillus pyocyaneus might be inhibited, and there might be a tendency to grow in threads or chains by microbes which did not naturally present this feature. No one had yet succeeded in separating out a pure agglutinin, so that it was impossible to say whether these inhibitory actions were due to the agglutinins themselves or to substances associated with them. The fact of this association, however, was extremely suggestive.

Professor MCFADYEAN (London) congratulated Dr. Durham on the extremely able manner in which he had dealt with a difficult subject. He thought that it was not only of laboratory interest but it had a wide clinical interest as well.

Dr. GRÜNBAUM (London) said that he had worked chiefly on sera from the human subject, the agglutinative action of which was often small. He thought it was important to note that in low dilutions the agglutinative property did not necessarily go hand in hand with the protective power. He suggested that a fourth specific property of the serum of an immunised animal might be added to those mentioned by Dr. Durham—viz., a paralysing action. This was especially noticeable in the case of motile organisms, but even non-motile organisms might show loss of Brownian movement—probably by a swelling of their envelope in the specific serum.

Professor MCWEENEY (Dublin) said that he, too, had worked only on human sera. He suggested that a fifth serum reaction might be added—viz., a concatenating action. He had come to the following conclusions from a study of typhoid bacilli grown in broth containing typhoid serum: (1) there occurred loss of motility; (2) there was a tendency to the formation of short chains of bacilli; (3) this method was suitable for clinical diagnosis; and (4) it was of special value in those cases in which the ordinary Gruber-Widal clumping reaction was delayed or uncertain.

Dr. SIMS WOODHEAD (London) said that in these sera there appeared to be a number of actions which ran parallel to a certain extent and later diverged. He had already stated in this section that the toxins were by no means such simple bodies as were at one time supposed and they had just heard that the sera were equally complicated. He pointed out that the sera which were most highly protective—e.g., tetanus and diphtheria—were less agglutinative; and he regretted that the highly agglutinative sera—e.g., cholera and typhoid—could not be raised to such a degree of immunising activity. He agreed, however, with Dr. Durham, as against Widal, that a high agglutinative power in either cholera or typhoid could hardly be associated with a low immunising power.

FRIDAY, JULY 29TH.

Dr. ALFRED G. LEVY (London) read a paper on the

Blood Changes after Experimental Thyroidectomy.

He said that his experiments had been performed on the dog so that the parathyroids and thyroids were removed together, and suggested that the variations which occurred in his

results might be due to the presence of small accessory thyroids in the region of the aorta. He found that there occurred after thyroidectomy a certain degree of anæmia, which, however, was neither very intense nor very constant. The red corpuscles and the hæmoglobin were diminished together, but the total fall did not exceed 25 per cent. of the normal. In the more pronounced cases the liver gave a slight iron reaction. Leucocytosis was a very constant feature, but the degree varied enormously. Increase of the fibrin of the blood invariably occurred and was often very considerable. The proteids and the total nitrogen also underwent diminution. The total solids were always reduced. In most instances the loss of solids was greater than the loss of proteids, but sometimes the loss of proteids was the greater. These facts appeared to point to a varying loss of some and a varying gain of other non-proteid material. Throughout these experiments careful attention was given to the housing and feeding of the dogs so that no fallacy might thereby be introduced. In conclusion, he referred to the striking want of interdependence among the various blood changes and to the fact that they bore no relation to the rapidity of onset or the severity of the symptoms.

Dr. D. A. WELSH (Edinburgh) said that although he had never examined their blood during life he had observed in animals dying from removal of the parathyroid glands alone that the tissues and organs were often anæmic and showed evidence of commencing fatty degeneration.

Dr. MOTT (London) suggested that the tendons and the connective tissues of the body should also be examined in relation to these blood changes.

Dr. MUIR said that he had examined the blood in cases of myxœdema in man and had found a slight degree of leucocytosis, but the condition of the leucocytes was variable.

Professor RALPH STOCKMAN (Glasgow) read a paper on

The Pathological Effects of Dead Tubercle Bacilli.

He said that he had had three objects in view—(1) to compare the effects of dead with those of living bacilli; (2) to see if fibroid changes were especially produced by the dead organism; and (3) to find whether animals injected with dead bacilli would still react to tuberculin. His first experiment was on a healthy dog; it was injected with tuberculin and no reaction occurred. An injection was made into the jugular vein of about 50 c.c. of a glycerine broth culture of tubercle bacilli which had been sterilised at 110° C. A rapid rise of temperature occurred, which continued for some days. Seventeen days later, when the temperature had subsided, tuberculin was injected, but the reaction was slight and indefinite. When the animal was killed, four months after the intravenous injection, the pleura was found to be studded with small fibroid nodules and the liver showed a large number of small tuberculous masses in its substance. His second experiment was on a pony. Having been tested with tuberculin with a negative result it received into its jugular vein a similar enormous dose of dead tubercle bacilli. The immediate effect was a marked rise of temperature for about a week. Three weeks later the tuberculin test gave a distinct reaction. The animal was then killed and the lungs were found to contain very numerous small tuberculous nodules, which consisted chiefly of a connective tissue overgrowth with few giants cells and no distinct caseation. Numerous bacilli could be demonstrated in these nodules by the ordinary method of staining. The other organs showed no tubercle. The third experiment was on a number of cats which were fed on dead tubercle bacilli in order to see if any lesion could be produced through the alimentary tract. No tuberculous lesion, however, was found in any organ, though the animals had been allowed to live from one to two months.

Professor J. R. MCFADYEAN (London) said that these experiments were of considerable interest, but he did not think that they had any intimate relation to the processes of tuberculosis naturally occurring in animals. He had never experimented with such colossal doses of bacilli and he believed that no lesions followed the injection of dead bacilli unless enormous doses were given. He did not think that the formation of giant cells was so closely related to processes of caseation as Professor Stockman had maintained, for caseation was a result of living organisms alone.

Dr. SIMS WOODHEAD (London) said that he had investigated the effects of injecting dead bacilli and had found that dead bacilli locally injected produced a local lesion in which the bacilli could still be stained but from which no secondary infection could be obtained. Intravenous injection of dead bacilli produced numerous fibroid nodules chiefly in the lungs. He pointed out that similar injections of living bacilli in guinea-pigs produced caseous tubercles in the lungs, but that with devitalised bacilli fibroid non-caseating lesions occurred. He had also found that if the injection were made into the thigh then fibroid tubercles might appear not only in the lung but in the liver.

Professor GREENFIELD (Edinburgh) said that all the previous speakers seemed to have acknowledged a possible flaw in their experiments and he suggested that it was just possible that some of the bacilli injected as dead might be still living. Undoubtedly, however, dead bacilli seem to be capable of producing elementary tubercle follicles with giant cells. In regard to the occurrence of nodules in the liver after intravenous injection he thought it quite possible that dead bacilli might pass through the pulmonary capillaries and so reach the liver.

Professor MCWEENEY (Dublin) suggested that the virulence of the organisms should be determined before they were devitalised. He thought that the same result could hardly be expected to follow the presence in the tissues of virulent and of attenuated organisms even though they had previously been devitalised.

Dr. MOTT (London) suggested that inoculation of the fibroid nodules produced by the action of devitalised bacilli should invariably be performed.

Dr. J. J. DOUGLAS (Edinbugh) read a paper on the Local Action of Crude Diphtheria Toxin and illustrated his results by a series of lantern slides from photomicrographs. Dr. MUIR and Dr. LAZARUS-BARLOW spoke.

Dr. S. R. CHRISTOPHERS (London) read a paper on the Action of Normal Serum in Relation to the Diagnosis of the Typhoid Bacillus.—Professor MCWEENEY described some work he had done on the same subject.

Dr. ALEXANDER HAIG (London) gave a Demonstration of the Granules precipitated in the Blood by Chloride of Ammonium. He maintained that the number of these granules varied with the quantity of uric acid passing in the urine.

PHARMACOLOGY AND THERAPEUTICS.

FRIDAY, JULY 29TH.

Professor RALPH STOCKMAN (Glasgow) introduced a discussion upon the

Therapeutic Value of Recent Synthetic Analgesics: Their Benefits and Later Attendant Risks.

Most of these preparations, he said, had been introduced to us not so much as analgesics but as antipyretics. But long experience had demonstrated that medicines which merely reduce temperature had comparatively little beneficial effect on the course of a continued fever such as typhoid, and as a routine treatment they had practically been abandoned. The direct antipyretic treatment of feverish conditions had also to a great extent gone out of fashion owing to the more specific treatment by serum therapeutics. But in diseases marked by great pyrexia, such as acute rheumatism and malaria, the combination of an analgesic and antipyretic with a specific such as salicylate or quinine respectively was of great value. It was more directly to their value as analgesics that Professor Stockman directed attention. No one member of the group acted in an ideal way either in reducing temperature or in relieving pain. The drawbacks and dangers had been exaggerated. Still, no one was without more or less serious drawbacks for general and frequent use in practice. Their chemical genealogy was studied as being the best way of leading up to their remedial and poisonous actions. All were closely allied to phenol and to anilin. By a chemical modification of these two bodies we were able to lessen their toxicity and to increase their analgesic action. But we could not yet prophesy what the value or action of a combination would be without long trial. Tables of graphic formulæ were exhibited illustrating the close chemical relationship of these bodies. In doses ordinarily given phenol had very little effect on the blood or nervous system, but large doses had poisonous effects. The toxicity of salicylic acid in ordinary doses was almost *nil*, but very large doses set up skin eruptions and other undesirable symptoms. When we came to anilin we found its medicinal use was dangerous, its action on blood causing cyanosis and dyspnœa. Phenylhydrazin caused thrombosis in vessels and was a strong poison. Pyrodin was impossible

as a therapeutic agent. All had the same kind of action on the grey matter of the spinal cord: conduction of painful impressions was lessened and perception of impressions in the grey matter of the brain was lessened. To these actions was the analgesic effect due. Because of the absence of their action on the motor centres the person could go about his business and herein lay their great value over opium and chloral. We were in want of two drugs, one to act on the pain-conducting paths of the cord and another to act as a hypnotic on the cerebrum. Drugs, like men, had the defects of their qualities. Their depressing effects might lead to respiratory and cardiac embarrassment. Collapse from a direct action on the nervous system was extremely rare and only occurred in the debilitated. We should never get a drug quite free from this, for it depended on the sensibility and reaction of the individual. We could diminish the chance of collapse by using a drug which was not too active. In seeking an analgesic drug from amongst the enormous number of candidates for therapeutical favour we should reject those which had destructive action on hæmoglobin. It is fortunate that in practice they had these poisonous qualities only in small degree. Professor Stockman had given up the use of acetanilid because of its action on the blood and because of the small range of its dose. There was no doubt that when it was introduced it was given in much too large doses. Antipyrin was much safer, but he seldom gave it now. Phenacetin was equally powerful and much less apt to be attended by danger. It was much the safest and best and he had never seen the slightest degree of faintness or unpleasantness result. The only other member in which he placed confidence was lactophenin, which was practically identical in composition with phenacetin. Antithermin was distinctly poisonous and was not a substance to be used at all. In conclusion, Professor Stockman said that if given with care any ill effects were infrequent and that it was a matter largely of dosage.

A paper by Dr. C. D. PHILLIPS (London) (read by the SECRETARY) followed in which he classified synthetic analgesics into three main divisions—viz., those derived from: (*a*) chinolin; (*b*) anilin; and (*c*) salicylic acid. Analgen, a chinolin derivative, was not a powerful analgesic agent. Its great evil was its destructive action on the red blood corpuscles. Euphorin was a powerful analgesic; it tended to interfere with the respiratory process, it did not affect the kidneys, and it was valuable in the pain of orchitis. Methylene blue was a useful analgesic in all forms of headache; it often, however, caused cystitis and strangury. Pyoktanin was of little value. Agathin was unreliable and even increased pain; it was unworthy of a place. Pyramidon, salipyrin, tolipyrin, tolisoll, and ferripyrin were harmless, but were not sufficiently powerful for the relief of urgent pain; they were, therefore, unimportant. Malakin was slow in action and was much inferior to antipyrin; it was of service in acute rheumatism and was free from risk. Neurodin was feeble and harmless, but it was uncertain and inferior to phenacetin and antipyrin. Lactophenin was sedative more than analgesic; it was inconstant and often failed. The action of citrophen was much the same as that of phenacetin, but the risks were greater and the benefits were less; it ranked much below phenacetin. Apolysin was more toxic and more soluble than phenacetin, it was of great value in migraine and was well tolerated in large doses. If taken on an empty stomach, however, its toxic effects were specially liable to occur. Phenocoll was a powerful analgesic but not so safe a remedial agent. In children and in adults with phthisis it caused alarming cyanosis; in the future it might, however, take a place. Salocoll caused no gastric irritation. Salophen was probably the best of recent synthetic analgesics. Like salol it was not decomposed till it reached the intestine, its toxicity was very slight and in medicinal doses it did not produce tinnitus. It was good in neuralgias of children and was as effective and as safe as antipyrin and phenacetin. Salophen was thus of high value and of great promise. Agathin was to be avoided. One should hesitate to use analgen, citrophen, euphoren and lactophen. Pyoktanin, pyramidol and salocoll were unnecessary.

Dr. LOCKHART GILLESPIE (Edinburgh) pointed out the great benefit to be derived from adding caffein to these analgesics to prevent depression of the heart.

Professor LEECH (Manchester) said that a list of analgesics like that given afforded hope that we might yet obtain a substance better than any of those and so be able to relieve pain without doing any harm. He believed there was very little good in many of them and that dreadful mistakes were made in the dosage. Some of the evils put down to the drug were simply the result of accident and were not due to the drug at all. Professor Leech had no fear of antipyrin; he considered it useful in relieving pain and that it was harmless. Pyrodin was a most fatal drug. As to exalgin, much evil was seen in large doses but not in moderate ones. Antipyrin and phenacetin were so far, he considered, the best yet introduced.

Dr. LIDDELL remarked that he used exalgin without unpleasant symptoms and that antipyrin added to the great depression of influenza. He said there was great need for a local anæsthetic for the skin for the use of the dermatologist and that there was a field open to experimentalists in that direction.

Dr. HAMILTON (Hawick) had never used phenacetin or antipyrin without citrate of caffein. He considered that the deaths of many patients who died from heart-failure in influenza were actually due to the action of phenacetin and antipyrin. Much of the fear in many was due to want of knowledge of doses and most of the list of analgesics should be expunged.

Dr. GORDON did not agree with Professor Stockman in throwing cold water on antifebrin and exalgin. He advocated the use of small doses to begin with and by gradually increasing them danger was prevented. We were apt to attack pain from one specific point and forget that neuralgia might depend on more than one condition. He found antifebrin in doses of from ½ to 1 gr. give splendid results in painful malaise in children and from 1 to 2 gr. doses of exalgin he used with benefit in localised neuralgia such as toothache, also in locomotor ataxia. Antipyrin should always be guarded by caffein citrate in 2 or 3 gr. doses. He had seldom seen any untoward effects from the use of antipyrin, but the promiscuous employment of this drug by the laity did much harm. Phenacetin he considered distinctly beneficial and he thought that this drug and antipyrin were our most important remedies for pain.

Dr. FREW used antipyrin largely in children's diseases and antifebrin also very extensively, because its action was not more dangerous than that of antipyrin, while for working-class practice it had the advantage of being much cheaper than antipyrin. The knowledge of the dose he thought the chief point in preventing injury; the condition of the patient ought always to be considered before giving large doses. The combination with caffein might do harm in cases of high tension.

Dr. AFFLECK (Edinburgh), President of the section, said the frequency and importance of the use of these remedies was a sufficient reason for a discussion of them. Unfortunately they were largely used by the public irrespectively of medical advice. At the beginning of an acute illness these drugs were often taken by patients without consulting a medical man and thereby a bias in a wrong direction was given to the course of the illness. He thought there was really no danger in these remedies if given with due care and that it was largely a matter of individual experience, prejudice, and liking. Untoward effects appeared occasionally—e.g., in advanced phthisis. Of their value as pain-relievers there was no doubt—e.g., exalgin in cancer of the stomach. As regards analgesic effects he was apt to favour phenacetin because he had seen no ill-effects after its use. Much depended on the directions given; the sedative effect was largely increased by repose; the patient should not go about. The most important effect of salicylic acid and its compounds was the relief of pain; the delirium which sometimes followed its use was probably due to idiosyncracy and therefore great watchfulness should be exercised.

Professor STOCKMAN, in reply, said that when any of these new bodies containing phenol and anilin were introduced they should be regarded with great suspicion till they had been well tested. As to caffein, it produced high tension and a stimulation of the cerebrum and probably of the cord and should not be employed in routine practice. There were many complaints in the profession as to the large number of analgesics thrown on the public. Acetanilid must be given in small dose and carefully. It was not a drug to be given freely and frequently in practice. As a local analgesic we must still be content with ethyl chloride and cocaine.

Mr. J. C. MCWALTER (Dublin) read a note criticising the

New British Pharmacopœia and deploring what he termed the "secrecy" maintained in its production.

Professor LEECH (Manchester) and Dr. TIRARD (London), both members of the Revision Committee of the Pharmacopœia, replied, alleging that the criticism was based on an imperfect appreciation of the law under which the Pharmacopœia had to be issued.

LARYNGOLOGY AND OTOLOGY.

FRIDAY, JULY 29TH.

The Pathogenesis and Earlier Clinical Evidence of Laryngeal Tuberculosis.

A paper on this subject was read by Dr. W. JOBSON HORNE (London), and a lantern demonstration of microscopic specimens was given which showed how the larynx became infected, the origin and formation of giant cells, and the changes which occurred in the blood-vessels and muscles in the commencement of the disease. The lantern photographs left no doubt as to the accuracy of the explanation offered. Dr. Horne indicated the signs and symptoms which he regarded as the clinical counterpart of the morbid changes noted in the tubes, and which he considered of value in arriving at an earlier diagnosis, not only of laryngeal tuberculosis but also of pulmonary tuberculosis.

A discussion ensued, in which Dr. TILLEY (London), Dr. ST.CLAIR THOMSON (London), and Dr. MILLIGAN (Manchester) took part.

The following papers were also read and discussed in this Section:—

Dr. WALKER DOWNIE (Glasgow): Three cases of Foreign Bodies in the Throat, in which the position of the body was determined by the Roentgen rays. Illustrated by skiagraphs.

Dr. ADOLPH BRONNER (Bradford): A Plea for a more efficient Sterilisation of Nose and Throat Instruments. Dr. Bronner indicated the danger of infection from case to case, and demonstrated an apparatus he had designed for sterilizing throat-mirrors and other throat instruments.

Dr. HAMILTON BALLANCE (London) reported a case of Lateral Sinus Pyæmia occurring in a young married woman during her first pregnancy, the clinical features of which were rigors, operation, jaundice, delivery, and tonsillitis (the tonsillar abscess was opened under cocaine), attended with severe symptoms of cocaine poisoning; further rigors, facial erysipelas (which was treated with injections of 20 c.c. of streptococcus serum antitoxin), pyæmic abscesses in calf, shoulder and kidneys; serum repeated; recovery. Dr. Ballance attributed the recovery in some measure to the streptococcus serum. In the discussion which followed, Dr. BARR, Dr. MILLIGAN, and Dr. HORNE took part and mentioned the importance and value of rigors in arriving at a diagnosis in this form of ear disease.

Dr. ST.CLAIR THOMSON (London): Nasal Hydrorrhœa. The paper went to show that several reported cases of nasal hydrorrhœa were not such. The diagnosis could in great measure be decided by the nature of the fluid.—A discussion ensued and supported this view.

Dr. J. MIDDLEMASS HUNT (Liverpool): Fibrinous Rhinitis. Owing to pressure of time this paper was handed in to the Secretary.

A vote of thanks to the President and Secretaries completed the business of the Section.

MEDICINE IN RELATION TO LIFE ASSURANCE.

FRIDAY, JULY 29TH.

A paper was read by Mr. J. M. M'CANDLISH, late President of the Faculty of Actuaries in Scotland, upon

The Medical Advisers of Life Assurance Offices: Some of their Duties and Difficulties.

Mr. M'Candlish began by referring to the time when life insurance was conducted without medical examination and without reference to age. Life insurance was founded upon the principle that longevity in the individual is uncertain, in the mass certain, so that the loss entailed in the early death of individuals can be spread over a class, those surviving paying for those dying early. But amongst a group of persons taken haphazard even of the same age some individuals are almost certain to die before the rest and medical examination is the chief means of excluding these and so obtaining a group of cases which might be equitably placed in one class. The duty of the medical officer was not to cure disease, but to detect those diseases and conditions which would be likely to shorten life. Mere ill-health was often of no consequence in life assurance. In the case of annuitants it was found that self-selection acted in favour of the annuitant and probably also it would in the case of life assurance if not corrected by medical and other office selection. Persons were sometimes tempted for monetary reasons to conceal defects in their constitution leading to early death to detect which was often very difficult and sometimes impossible, and here the chief means of detection was the medical examination. Allusion was made to the great social value attached to the subjects of this section.

The PRESIDENT (Dr. MUIRHEAD) said medical examiners sometimes manufactured difficulties for themselves by the abrupt way in which they asked questions. The applicant's trepidation was thus increased and he was apt to answer wildly and even inaccurately. A just estimation of extras for under-average lives was dependent upon the highest faculty of medicine, prognosis, and could only be acquired by long experience and study. It was gratifying to find that the extras, although fixed empirically, had up to now on the whole met the extra risk. Sometimes, however, they had been too high. The actuaries could settle the question equitably by reference to the records of their offices.

Dr. SOMERVILLE, speaking as an examiner, regretted that the reason for deviating from their advice by the chief medical officer was not communicated to the examiners, who were thus left in the dark.

Dr. DAWSON WILLIAMS (London) urged the importance of the medical examiners being acquainted with the working of insurance offices.

Mr. LOW, Actuary and Manager of the Edinburgh Life Office, read a paper on

Extra Rating as a Statistical Problem.

Extra risks must be measured in the same way as ordinary risks by comparing lives at risks with deaths. Allusion was made to the investigations by this method made by Mr. Manly and Dr. Glover Lyon into the extra mortality amongst insurers giving a family history of consumption. From these results it would appear that there was an extra risk more marked in the case where parents had died from consumption than where brothers and sisters had died from that disease. But the paucity of numbers involved in the investigation prevented the results from being accepted as final. The advisability of combined investigation undertaken by all the offices was urged. Mr. Low referred to an investigation made by the statistical methods in the mortality of obese insurers which proved that a considerable extra obtained after five years' insurance chiefly observable between the ages of fifty and sixty, also to that of some Scotch offices on the high mortality amongst liquor-sellers. Their actual deaths exceeded the expected by 83 per cent., 430 against 235. In conclusion, Mr. Low advocated a joint inquiry by actuaries and medical officers into this and kindred questions by means of the records of the life offices. He pointed out, however, that the inquiry now in course of completion into the general experience of the offices stood in the way of such an inquiry for the moment.

The PRESIDENT insisted upon the necessity of attention to individual cases as well as to average, instancing the unfairness that would ensue if all cardiac cases were treated alike.

Dr. GLOVER LYON (London) pointed out a similar injustice involved in putting in the same class all cases, robust and delicate, giving a family history of consumption. He looked forward to a complete inquiry into these points by actuaries and medical officers, and suggested a joint action between American and British offices to meet the expense involved.

Dr. SPRAGUE (actuary) said that in an inquiry not yet published they had found that, amongst 1000 policies whereon an extra had been charged for consumptive family history, the extra charge was about twice as much as it should be.

Dr. RITCHIE (Vice-President) referred to the importance of sometimes considering individual cases on their own merits.

Mr. JAMES MEIKLE (actuary of the Scottish Provident Institution) read a paper upon

Gout as a Factor in Life Assurance.

He gave the mortality experienced amongst 525 cases which had been rated up for gout. There had been 184 deaths amongst these against 111 expected deaths. The mortality amongst gouty publicans was shown to be very high. The

extra rates charged had covered only about half the real extra risk.

The PRESIDENT urged the necessity of offices combining to make a uniform extra rate for gout.

Dr. SPRAGUE (actuary) advocated independent action in the matter, remarking that in the long run it would be better not to interfere with the action of offices willing to take unfair risks.

Dr. BALFOUR GRAHAM (Leven) thought the extra risk due to gout had been reduced of late years on account of the discovery of medicinal solvents of the gouty products.

Mr. CHATHAM pointed out the fallacy of rating up endowment policies in the same way as all life policies.

Mr. LOW raised the question as to the value of the figures, relating as they did to old experience; he thought the condition then designated gout might be different from what is now understood by gout.

General Report.

This first meeting in connexion with the Association on the subject of Medicine in relation to Life Assurance was, on the whole, exceedingly successful. This was due largely to the fact that the meetings took place at a centre of life assurance. It is the first occasion on which actuaries have met medical officers in debate by formal invitation and the experiment has proved very satisfactory. The attendance was good at all the meetings, though slow to collect on the first day; during the last two days exceptionally so. The papers were all short, giving ample time for discussion. There was a total absence in the papers and discussion of tedious references to medical points of common knowledge sometimes introduced into such debates; all that was said had a direct bearing on life assurance. The figures submitted were object lessons of statistical science. The conference arranged between the Section of Laryngology and Otology and the above Section by Dr. McBride, in reference to the question of middle ear disease, was a happy thought and proved most successful and instructive. The only flaw in the arrangements—and this was a serious one—was that the meetings took place at the same time as those of Medicine and Surgery. Several members expressed their regret at not being able to be present as they were obliged to be at other sections. Life assurance is not in the ordinary sense a specialty but a special application of medicine carried out by general physicians and surgeons, and meetings to discuss the subject should be arranged so as not to clash with the meetings on general subjects. This might be done by holding the meetings in the afternoon, the other sections being held in the morning. It is scarcely likely that when the Association meets at places not the headquarters of life assurance this section will hold so important a position as in the present instance, nor could a like attendance of actuaries be obtainable. One or two papers, therefore, read in the afternoon on questions of special importance would probably meet the circumstances, if, indeed, it would not be better to omit this subject from the programme except when the meetings are at insurance centres. The predominant note through all the meetings was a desire to get more accurate knowledge of the value of aberrations from the normal by means of a joint inquiry by medical officers and actuaries through the records of life offices.

TROPICAL DISEASES.

FRIDAY, JULY 29TH.

Dr. ANDREW DAVIDSON, LL.D. (Edinburgh), Vice-President, in the chair.

The attendance at this section was very gratifying to the organisers, for up to the very end of the meeting, at 1.30 P.M., on Friday a large number still took an active part in the proceedings. The whole meeting on July 29th was given up to a discussion on Plague.

Dr. W. J. SIMPSON, late medical officer of health of Calcutta, read a paper on

Plague in India.

Dr. Simpson paid a graceful tribute to the excellent work and the heroism displayed in India by medical men, nurses, civil and military officers, missionaries, and native assistants. In India plague was not an endemic disease but an exotic with long intervals of mostly over one hundred years. In 542 A.D. accounts of plague were met with in Indian annals. Some 800 years ago a Hindu writer gave instructions to his fellow-countrymen as to what steps to take in the event of an outbreak of plague and laid stress upon the point that whenever a mortality amongst rats was observed they were to leave the locality. The rat infection was therefore very old as even in Biblical history we found the same animals or rather mice named as sources of infection. In remarkable confirmation of the behaviour of plague in Hong-Kong was the evidence given by Fryer, who stated that the great city of Surat in India was visited by plague in 1684 and that the disease continued for six years. Hong-Kong was now in the fourth year of its infection and there seemed no certainty that the visitation was over. Dr. Simpson was of opinion that the Levantine plague, although allied to the Indo-China plague, was a species that was dying out and different in the acuteness of its powers of infection and destruction from the deadly disease now raging in India and China. He was of opinion that the pandemic form in India might invade countries where the more attenuated form of the disease now existed, and that as plague was a slow traveller it behoved Western Asia and Eastern Europe to keep a careful watch on the spread of the disease. Dr. Simpson discussed the prevalence of fever with glandular enlargements which occurred in the Shropshire regiment, which went from Hong-Kong to Calcutta, after being engaged in cleansing duties in Hong-Kong during the 1894 epidemic there. In January, 1895, the regiment went to Calcutta and this disease was first diagnosed as syphilis, then as malarial fever with bubo, and finally the cause was declared to be unknown. In June, 1896, one of the medical officers to the regiment was attacked with fever and the glands of the neck, axilla, and groin were all enlarged. A goodly number of similar cases were met with in the town; moreover, the rats became sick and the grain stores swarmed with diseased and dead rats. In spite of opposite evidence it was well-nigh certain that plague in a sporadic form had been in Calcutta since 1895 or 1896. Even in the spring of 1898, when plague was in evidence, it was held by some that it was "only malarial fever accompanied by buboes." Dr. Simpson advocated a proper sanitary service for India and gave in detail the essentials of such a service. He continued: "I divide the medical part of a sanitary service into three branches—(1) the administrative, (2) the investigative, and (3) the scientific—which should be in close connexion with one another and in large towns should form parts of one large department. Broadly, in England the administrative is represented by the local health officers and their subordinates, the investigative by the medical inspectors of the Local Government Board, and the scientific by the laboratory researches made into the causes of disease in connexion with special investigations of either the medical inspector or local health officer. The Government of India has always been imbued with the great importance of establishing laboratories in India, but the state of finances has invariably blocked the way. This difficulty, however, disappeared in a most charming and unexpected manner in 1897, when a number of the Princes in India expressed their desire to commemorate the sixtieth year of Her Gracious Majesty's reign by establishing a Health Institute for India, which should have M. Haffkine as its first director. The spontaneity of the offer and the generosity with which it was made were enhanced by the peculiar appropriateness of this Royal memorial to our beloved Empress Queen, whose reign has been so distinguished for the advances made in scientific and preventive medicine. The Princes were anxious that the site should be chosen and the foundation of the Health Institute laid on the day of the Jubilee. Owing to delays over which possibly the Government of India had not full control, in consequence of its plague and famine work, the auspicious day was allowed to pass and no foundation-stone was laid. Everyone acquainted with India will know the importance of an auspicious day. It is the symbol of success and good fortune."

Professor W. M. HAFFKINE, C.I.E., and Surgeon-Major BANNERMAN, I.M.S., communicated a paper on

The Testing of Haffkine's Plague Prophylactic in Plague-stricken Communities in India,

which was read by the HONORARY SECRETARY. A series of experiments upon animals was recorded and the immunity conveyed and the powers of recovery of protected persons by inoculation with plague serum were stated. It

would appear from undeniable testimony that the protection afforded was most pronounced and that the possibility of recovery of inoculated persons when attacked was highly satisfactory. As examples of protection the following statements were given: 1. Half the inmates of the Byculla House of Correction were inoculated with Haffkine's serum on Jan. 30th, 1897. From this date the inoculated and uninoculated lived together under exactly similar circumstances during the time plague prevailed. Of 173 unprotected persons 12 were attacked by plague and 6 died; and of 148 protected persons 2 were attacked and none died. 2. During 1897 8200 persons were inoculated in Bombay, of whom 18 (all natives) were attacked and only 2 died, and these two developed plague symptoms within twenty-four hours after inoculation. 3. In Lanowlie, a small hill station near Poona, with a population under 2000, a recrudescence of plague occurred. The officers of the Research Laboratory took charge of two wards of the town most severely attacked and made a house-to-house visitation, carefully noting the effects of previous inoculation. Of 323 protected inhabitants 14 were attacked and 7 died; whilst of 377 unprotected persons 78 were attacked and 58 died—a reduction in mortality by inoculation of 85·7 per cent. 4. Of a section of the Mussulman community of Bombay 5184 were inoculated and 8146 remained unprotected. Amongst the former 7 deaths and amongst the latter (the unprotected) 177 deaths occurred from all causes. Altogether inoculation lessened the mortality by 86 per cent.—a result which was sufficient to establish inoculation as a preventive and remedial agent in plague of high value.

Brigade-Surgeon-Lieutenant-Colonel DIMMOCK, I.M.S., gave a brief outline of

The Measures Adopted for Dispelling Plague in Bombay.

It would appear that the city was carefully watched, inspected and disinfected by well-organised bands of workers from almost the very commencement of the epidemic, and that unceasing endeavours were made to induce the native population to accede to the requirements of sanitation.

An abstract of Surgeon-Captain L. F. CHILDE'S report to the Plague Research Committee in Bombay on the

Pathology of Plague

was read by Brigade-Surgeon-Lieutenant-Colonel ARNOTT. Plague, according to Surgeon-Captain Childe, is met with in three varieties. First, the bubonic form. In this variety the main glandular lesion was met with at the seat of the primary bubo and but slight signs of disease were found in other glands. Associated with this engorgements and petechiæ or hæmorrhages were found in nearly all viscera. Second, the septicæmic form. Glandular enlargement in this phase of the disease was general in all parts except in the mesenteric glands. Here evidences of change were less distinct and the necropsies showed that the plague bacillus had not reached the stomach or intestines by the food. Third, the pneumonic form of plague. Whilst the lymphatic glands and other organs were scarcely affected the lungs were engorged with pneumonic patches here and there, or occasionally half the lower lung was found in this state. The bronchial glands were either swollen or œdematous or quite normal.

Surgeon-Major BAKER, I.M.S., referred to the great danger to which workers at house-cleaning in plague were subjected when infected materials were handled or moved by them before disinfectants were applied.

Mr. CANTLIE (London) referred to the excellent work done by Yersin, but wished to discredit the notion that Yersin's name should be associated with Kitasato's in the discovery of the plague bacillus. Kitasato was demonstrating plague bacilli a week before Yersin had his preparations ready. Mr. Cantlie stated that he believed India was only commencing her plague troubles and that the urgency for a sanitary service for India as suggested by Dr. Simpson was imperative.

After the business of the meeting was over Dr. ANDREW DAVIDSON, the chairman, proposed that the section should send a message of congratulation to Surgeon-Major Ronald Ross at Calcutta upon the brilliant work he has done in connexion with the extra-corporeal life of the plasmodium malariæ and that a vote of thanks be accorded to Dr. Patrick Manson for his exposition of and share in Surgeon-Major Ross's work.

The proposition was unanimously carried, as was also a vote of thanks to the honorary secretaries.

PHYSIOLOGY.

WEDNESDAY, JULY 27TH.

Professor WILLIAM RUTHERFORD (Edinburgh), the President of the Section, delivered an address on

Tone Sensation with Reference to the Function of the Cochlea.

This address is published in another part of our present issue.

Dr. AUGUSTUS D. WALLER (London) read a paper on

The Action of Anæsthetics on Vegetable and Animal Protoplasm.

This was an extension of previous work on the action of anæsthetic gases on living matter in which nerve and muscle were used as representative examples. In the present research other protoplasmic tissues, such as spinal cord and retina, and vegetable protoplasm in the form of cells of vallisneria, *Elodea Canadensis* (the Canadian duckweed), and nitella were investigated. Dr. Waller then gave a brief explanation of his method of experiment by a series of lantern slides, showing the arrangement of the nerve upon the stimulating or "questioning" electrodes and the electrodes connected with the galvanometer or "answering" electrodes. He then described an apparatus by which the effects of a stream of an anæsthetic gas could be studied on a vegetable cell (e.g., of elodea) and a frog's nerve simultaneously, the stream of gas passing through a moist cell in which the vegetable cell was examined by a microscope and then through a moist chamber in which the frog's nerve was arranged in the usual way. The effect on the vegetable cell was studied by watching the rotation movements of the protoplasm and counting the number of chlorophyll bodies which passed a given spot per minute; the effect on the nerve was studied in the usual way by the galvanometric response. The results were as follows: nitrous oxide had little or no action on nerve, and the same result was obtained with vegetable protoplasm. Carbon dioxide caused a diminution of the electromobility of the nerve and an arrest in the movements of the plant protoplasm, followed in each case by a return to and beyond the normal as the effect passed off. Ether caused a diminution or arrest of these functions followed by a return to the normal both in the case of the nerve and of the plant. Chloroform caused complete and permanent abolition in both cases. Dr. Waller had also studied the effect of anæsthetics on the electrotonic currents obtained in a long cell of nitella—e.g., carbon dioxide caused a temporary abolition of these currents which returned as the carbon dioxide passed off. He had also studied the effect of anæsthetics on the retinal currents obtained by illuminating the eyeball of a frog with standard amounts of light at regular intervals and found the same difference between the action of ether and chloroform as he had previously found for nerve. In confirmation of these results he had also investigated the effect of ether and chloroform on the reflex excitability of the frog's spinal cord. A slight dose of strychnine was given and the frog arranged in a bell jar and a slight touch applied to its hind limb at a definite rate, say once a minute, yielding a reflex jerk. He found that ether abolished this reflex response, but only temporarily; chloroform, on the other hand, abolished it completely and permanently. It was of interest to note that these effects occurred with weaker strength of ether and chloroform than was the case with nerve or the heart. On the whole, however, nerve was by far the best living tissue to use in these investigations.—In the discussion which followed Professor WAYMOUTH REID objected that since the frog was suspended in a bell jar—the air of which was impregnated with the vapour—a possible fallacy existed in that the results might have been primarily due to the action of the anæsthetic on the endings of the nerves in the skin.

Dr. CORSAR STURROCK (Edinburgh) then read a paper on the

Selective Power of Tissues,

especially as illustrated in the mammary gland, in which he first briefly discussed the process of selection in general and then pointed out that no tissue possessed this power in so striking a degree as the mammary gland, since it produced a material, not for the nutrition of its own cells or of the organism of which it is a part, but of an entirely different organism. It selected from the blood a food, milk, resembling in the proportions of its constituents the freely-chosen diet of an adult, from which it, however, differed in the

following particulars: (1) the suckling required more proteid and salts than an adult for purposes of building up its tissues, since anabolism was in excess in the growing animal; (2) the suckling required more fat as heat-producing material since it had not developed to such an extent as the adult the muscular source of heat-supply; and (3) the adult required more carbohydrate because he performed more work. A study of the milk of various animals showed that their mammary glands selected the constituents of milk in proportions adapted to the diverse conditions of life under which the animals were placed—e.g., animals which grew rapidly were supplied with milk containing more proteid and salts than the milk of animals which grew slowly. Animals living under different conditions of temperature were provided with milk containing constituents more or less useful for the maintenance of body heat. Animals compelled to early muscular exertion received milk adapted to supply the material for the production of muscular energy. A chemical investigation of the cells of the mammary gland proved the existence in them of a nucleo-proteid which was of a highly complex constitution, containing a nuclein, a carbohydrate, and a proteid radicle. It might be the antecedent of caseinogen and of lactose. It contained a true nuclein, whereas caseinogen was a pseudo-nucleo-albumin. The nuclein bases which it contained were not excreted, but seemed to remain in the gland, probably in the nuclei of the cells as active agents in the formation of more mother-substance. Phosphocarnic acid—described by Siegfried as a constant constituent of milk—was present in the mammary gland in considerable quantities. It could also be split off from caseinogen by the action of rennet. It was more abundantly present in human than in cow's milk.—In discussing Dr. Sturrock's paper Professor WAYMOUTH REID remarked that an excellent example of the relation existing between the chemical nature of milk and the growth of the young was found in the case of "pigeon's milk." While the young birds were fed by their parents on this substance (a secretion from the crop containing nucleo-albumin, fats and salts) they grew at about ten times the rate which obtained during the subsequent period of grain-feeding.

THURSDAY, JULY 28TH.

Professor WAYMOUTH REID (Dundee) opened a discussion on

Intestinal Absorption.

The object of the discussion was to determine to what extent experimental evidence justifies the view that the absorption of aliments could be explained on physical grounds. The two main views held by physiologists on this subject were—(1) that osmosis and filtration were sufficient in themselves to account for the absorption of dissolved food substances; and (2) that the cells covering the villi took an active though unknown part which may be referred to as "cell action." To speak of cell action does not necessarily imply a belief in vitalistic action. He then illustrated by diagrams the effect of the partial osmotic pressures of the substances dissolved in the gut and in the blood and of the hydrostatic pressure on either side of the membrane on the process of absorption, from which it could be inferred that in the case of a substance to which the gut wall was permeable being in solution in the gut a suitable mechanism for absorption on simple physical lines existed. If the special case be considered in which the fluid in the gut was identical with that in the blood-vessels—i.e., when the serum of an animal was introduced into its own intestine—osmotic phenomena need not be taken into consideration and the only physical factor to consider was the difference of hydrostatic pressure. Professor Reid then gave a brief record of the results obtained by other observers by this method and then referred to his own experiments, in which, after the introduction of a measured quantity of its own serum into a loop of a dog's intestine and withdrawal after a given time, it was found that absorption occurred in spite of the fact that the hydrostatic pressure in the gut was well below that in the veins of the loop of intestine. This could not be explained by *ad*sorption or imbibition, but pointed to "cell action." This is confirmed by the results of removal of the epithelium of the gut. This was done more or less completely by various methods such as by producing a temporary anæmia of the gut-wall by clamping its vessels before the experiment or by the use of weak solutions of such drugs as sodic fluoride or osmic acid. In these cases absorption was much lessened and the absorption of water sometimes completely abolished in the case of sodium fluoride experiments. He therefore concluded that the epithelial cells are agents in the process of absorption of solutions from the gut, though not of necessity the sole agents. Certain experiments with peptone and glucose were then recorded which he regarded as suggestive of epithelial action in the absorption of these substances, though not conclusive—e.g., whereas glucose was more diffusible than peptone it was actually absorbed rather more slowly. Professor Reid had found in the serum experiments that the absorption of organic solids was much slower than that of the water while the salts were taken faster. He had found no evidence of nerves exerting an influence on the activity of the epithelial cells comparable to that of secretory nerves on gland cells.

Dr. NOEL PATON (Edinburgh) asked whether Professor Reid had considered or experimented upon the possibility of the rate of absorption being different in different parts of the intestine, to which Professor REID replied that he was investigating this point, the results of other observers being discordant.

Dr. DAWSON TURNER (Edinburgh) then demonstrated an experiment by Mr. Shelford Bidwell on the production of complementary colour sensations. The apparatus consisted of a disc, of which one sector was blackened, another was white, while the third sector was cut away. This open sector was arranged so as to succeed the blackened portion when the disc was rotated. A coloured object, strongly illuminated, was then looked at through the open sector of the revolving disc; if a proper speed of rotation were maintained no trace of the original colour was seen, but only the complementary colours, thus showing that a very short stimulation of the retina (rendered hyperæsthetic by the black sector) was sufficient to produce a strong negative after-image.

Professor G. N. STEWART read two papers: (1) On the Relation between Molecular Concentration (as Determined by the Lowering of the Freezing-point) and the Electrical Conductivity of certain Animal Liquids, with Special Reference to Blood; and (2) On the Changes which take place in the Electrical Conductivity and Molecular Concentration of certain Animal Liquids and Artificial Nutrient Media with the Growth in them of Putrefactive Pathogenic Micro-organisms. The red corpuscles of blood were practically non-conductors, but if blood be "laked" by distilled water electrolytes were set free and its conductivity was increased. However, if it was allowed to "lake" spontaneously its conductivity was unaltered. In that case it was probable that the electrolytes remained in the "shadows" of the red blood corpuscles, from which they might be set free by the addition of distilled water. If blood was allowed to putrefy its conductivity at first increased, but after a time became constant. A similar result was obtained with serum. This was due to the fact that the proteids which were not electrolytes had been broken down into simple bodies which were electrolytes, as shown by the progressive depression of the freezing point of the solution. Similar experiments were carried out with nutrient fluids such as peptone solutions in which various micro-organisms were grown with interesting results, the resistance getting less as the growth increased, and the freezing point being lowered owing to the breaking up of the peptone into simpler substances.

Professor MACALLUM read a paper on

Some Points in the Micro-Chemistry of Nerve Cells.

The object of the research was to elucidate the origin and nature of Nissl's granules. Their arrangement in the normal nerve cells of the anterior horn of the spinal cord of the dog was first described. These were often zones free from granules, especially round the nucleus and at the periphery of the cytoplasm. Since it had been suggested that these granules were precipitation products their genesis was studied in pig embryos, and diagrams were shown illustrating the cells at different stages, at first containing no granules and a nucleus very rich in chromatin; later a cap of substance taking the stain was found outside the nucleus, the nucleus containing less chromatin; later still this staining material increased in quantity and became granular. These experiments carried out by Mr. Scott suggested that Nissl's granules were probably derived from the nucleus, and this view was supported by their micro-chemical reactions, since they did not digest with pepsin-hydrocloric acid but they dissolved very

slowly in weak alkalies and were therefore probably nucleo-proteid in constitution. They were rich in iron, like the chromatin of nuclei, and contained phosphorus as shown by Professor Macallum's modification of Lilienfeld and Monti's micro-chemical reaction, in which phenylhydrazine was used to fix the colour.—In answer to Dr. MILROY, Professor MACALLUM stated that these granules gave the phosphorus reaction after treatment with pepsin-hydrochloric acid.

Professor W. H. THOMPSON (Belfast) read a paper on

The Influence of Peptone and its Precursors on the Work of the Kidney,

in which he gave a brief account of the physiological effects of albumose and peptone on the vaso-motor system and showed that none of them produced much effect on the vaso-motor apparatus of the kidney as compared with that on the splanchnic vaso-motor system generally. Tracings were shown of the effect of injection of peptone on kidney volume and general blood-pressure. He then described the influence of albumoses and peptone on the flow of urine as collected by cannulæ in the ureters. There was a great increase in the flow of urine in the second hour after the injection reaching a maximum in the third and becoming less in the fourth and fifth. By a study of the total nitrogen and the nitrogen excreted as urea, and allowing for the extractive nitrogen, it was found that a considerable amount (from 28 to 57 per cent.) of the injected albumose or peptone appeared in the urine, and this within the first 45 to 50 minutes.

Dr. FRASER HARRIS (Edinburgh) read a paper on

The Physico-chemical State of Caseinogen,

in which he gave a summary of the views held as to the relation of the caseinogen to the fat. He then described the relative amount of fat and caseinogen in the globules and the particles of milk, in cream, in centrifugalised milk, &c., and showed that caseinogen did not exist in solution in the milk plasma and that Ringer's solution of caseinogen was not a true solution. Caseinogen always occurred in company with the fat, though neither the "solution" nor the "envelope" theories would explain the amount of caseinogen in cream. The globules of milk were richer in fat, the particles richer in caseinogen. Caseinogen was to be regarded as part of a complex oleo-nucleo-proteid formed by the mammary gland cells.—Professor WAYMOUTH REID pointed out that proteids did not form true solutions and referred to the mechanical precipitation of egg albumin by Ramsden.

FRIDAY, JULY 29TH.

Dr. NOEL PATON (Edinburgh) read a paper on

Protoplasm and Zymin Action,

in which he recorded experiments with post-mortem livers and alcohol-hardened livers respectively which tended to show that the change of glycogen into sugar in the liver post mortem was due to katabolic changes in the liver protoplasm rather than to the action of a zymin such as hæmodiastase.

Dr. NOEL PATON also exhibited for Mr. MAHALANOBIS an Electrical Key for Physiological Experiments which could be used as a reverser or for sending currents alternately in different directions or to eliminate the make-or-break shocks.

Dr. W. BAIN (Harrogate) read a paper on

An Experimental Contribution to the Study of the Mechanism of Bile Secretion.

In this paper he first gave an outline of previous work on the influence of the nervous system on the flow of bile and then recorded experiments in which he had operated on dogs by Pawlow's method and then tied a graduated tube into the bile-duct. On stimulation of the vagi no effect on the bile flow was observed. With regard to the influence of cholagogues he had experimented by injecting the substance investigated into the external jugular vein and therefore regarded the effects he obtained as due to a direct action on the liver cells. He obtained a distinct increase in the flow with a solution of Plattner's crystals. 50 c.c. of strong sulphur water (Harrogate) produced a distinct and sustained increase. The action of the sulphur water was probably due to the sulphide of soda and barium chloride which it contained.

Dr. W. BAIN brought forward a second communication on

The Secretion of Bile in Man

in which he briefly referred to some conclusions to which he had arrived from the investigation of a case of biliary fistula. He had found no relation between the weight of an individual and the amount of bile secreted after a comparison of his own with other recorded cases. Diet exerted an influence on the flow, largely depending on the amount and nature of the food taken; the amount of liquid taken probably also exerted an influence. Exercise caused an increased bile flow provided perspiration was not too great at the same time. It was important in considering the bile flow to consider also the amount of bile solids. Bile and bile salts were almost universally admitted to be cholagogues.

Professor RUTHERFORD read a paper on

The Secretion of Bile in the Human Subject.

It was the result of a series of observations made on a patient (the subject of cancer) with a biliary fistula. The bile was collected every hour and the daily flow was found to be very regular. A chart showing the daily secretion of bile was shown; from this it was seen that after breakfast and dinner there was a rise in bile secretion which took place within an hour after the taking of food and was long maintained. A few observations were made on the influence of drugs. Morphia had no effect, as Professor Rutherford had previously observed in the dog. Salicylate of soda caused an increase, as did also salicin in one observation.

Dr. PATON showed for Dr. MONCKTON COPEMAN continuous tracings of the Daily Flow of Bile recorded by an apparatus devised for that purpose. The tracings were fairly uniform and presented very little variation. Dr. Paton himself regarded food as exerting very little influence on the flow of bile and suggested that the morning rise might be due to muscular activity. With regard to the action of drugs he regarded it as very difficult to determine whether any effect obtained was due to a direct action on liver cells or not.

Professor WAYMOUTH REID, quoted the experiments of Dastre on the dog, in which he found no direct effect from the ingestion of food but an increase from six to eight hours afterwards, which he suggested was due to the absorbed products acting on the liver or its nervous mechanism.

Mr. MAYO ROBSON had made observations on two cases of biliary fistula in healthy subjects and had found very little effect on the bile flow from the administration of drugs. He had obtained some slight increase with soda, soda-water, and iridin.

Professor G. N. STEWART also spoke. Dr. W. BAIN and Professor RUTHERFORD replied.

Dr. CARLIER (Edinburgh) read a paper on

Changes which occur in some Cells in the Mucous Membrane of the Newt's Stomach during Digestion.

The specimens were fixed by a corrosive method and double-stained. In newts which had fasted ten days the cells of the oxyntic glands of the stomach were seen to be large, with numerous large zymogen granules, which were not arranged in zones as in the pancreas. The nuclei were large and contained numbers of lanthanin granules. The changes at various intervals after ingestion of food were then described. 20 hours after food the cells appeared wasted and shrunken, the zymogen granules were few and small, and the nucleus was small and shrivelled, while the nucleoli had increased in size. 68 hours after food the zymogen granules were again large and present in greater numbers, the nucleus was clouded, the nucleoli were large and might be extruded from the nucleus. 144 hours after food the cells had returned to their normal condition. The changes in the cells were then described at shorter intervals after the taking of food, from which it was concluded that as soon as food was swallowed secretion began in the glands nearest the œsophageal end of the stomach and swept as a wave over the whole of the glands, reaching those near the pylorus last. This activity reached a maximum in from three to four hours and was then followed by a second period of rest and recuperation with the formation of fresh zymogen. Dr. Carlier then discussed the part played by the nucleus in the process and inclined to the view that the nucleus manufactured a prozymogen, which was subsequently converted into the zymogen granules. Professor MACALLUM corroborated Dr. Carlier's observations on prozymogens and stated that these bodies were rich in iron and phosphorus and were derived from the chromatin of the nucleus.

Dr. T. H. MILROY (Edinburgh) and Dr. J. MALCOLM (Edinburgh) brought forward a paper on

Metabolism of Nuclein under Physiological and Pathological Conditions.

The paper first gave a summary of the cleavage products of

nucleo-proteids outside the body and then the results of gastric and pancreatic digestions of the nucleins. Experiments were then recorded describing the actions of the absorbed products of nuclein digestion upon the formation and destruction of leucocytes. The nature of the decomposition products of the nucleins which appeared in the urine and their significance as a measure of nuclear breaking down were then discussed, especial reference being made to the importance of a disturbance of the ratio of nitrogen to phosphoric acid excretion ($N : P_2O_5$) in the urine, and the care that was necessary in drawing conclusions as to nuclear breaking down from the amount of alloxuric bases in the urine. They then shortly referred to the conditions existing in medullary leucocythæmia with special reference to the relationship existing between the number of leucocytes in the blood and the decomposition products of nucleins appearing in the urine.

Dr. CARLIER read a short paper for Dr. LOVELL GULLAND (Edinburgh) on

The Presence of Nerves on Intracranial Blood-vessels.

Obersteiner described their existence in an old gold-stained preparation. Dr. Gulland at first failed to find them, but recently, using Cox's modification of Golgi's method, had demonstrated an open network on the blood-vessels of the pia mater.—Professor G. N. STEWART stated that he had seen preparations by Professor Huber demonstrating their existence.

Dr. T. H. MILROY read a paper on

The Chemical Changes in Pelagic Ova during Maturation.

The specific gravity of the unripe pelagic ova was much greater than that of the mature ova, which had a specific gravity only slightly greater than that of sea-water. This was due to the absorption of water as the process of maturation proceeded; at the same time there was an increase in the albumin, the salts, and an organic phosphorus-holding body closely allied to ova vitellin. There is no synthesis of inorganic phosphorus compounds to organic phosphorus compounds in these ova.

Dr. NOEL PATON (Edinburgh) had found such a synthesis in salmon ova.

The meeting of the section concluded with a vote of thanks to Professor Rutherford.

THE PATHOLOGICAL MUSEUM.

SECOND NOTICE.[1]

IN our former notice we referred to the excellence of the educational and surgical exhibits. We now propose to mention some of the exhibits illustrating clinical medicine and pathology, which are quite on a par with the others.

CEREBRAL TUMOURS.

The Museum at the Edinburgh meeting would be remembered if only for the unique collection of intracranial tumours which it contained. This was so complete, and the subject is, so to speak, so much the order of the day, that we propose to notice the specimens in some detail, taking them for convenience of reference in order of localisation, mentioning quite briefly the symptoms which were associated during life. It will be remembered that the symptoms are of two kinds, those which occur in all intracranial tumours (headache, giddiness, &c.) and those varying with the locality affected. It is the latter with which we are now concerned. No. 426 is a large Sarcoma springing from the dura mater and causing atrophy and destruction of the right motor area. The case was that of a female, aged twenty years; there was absolutely *no paralysis;* there were only optic neuritis and other general symptoms of cerebral tumour; the patient died with convulsions. No. 427 is a Glio-sarcoma causing destruction of the left motor area without producing any notable paralysis until four days before death during an epileptiform seizure. No. 430 is a large Glio-sarcoma occupying the right centrum ovale, specially involving the internal capsule and optic thalamus. The patient was a male, aged forty-six years; there were left hemiplegia and hemianæsthesia, afterwards right hemiplegia, also conjugate deviation of the head and eyes towards the affected side; coma and death occurred after a history of only four months' duration. No. 436 is a large Aneurysm of the right posterior cerebral artery projecting into the lateral and third ventricles with softening of the brain around. There had been partial left hemiplegia, defective articulation and deglutition, progressive amentia and drowsiness. Nos. 428 and 429 are two specimens of Glio-sarcoma involving and destroying the temporo-sphenoidal and other lobes, unattended in either case by word-deafness, although this centre was involved, or other localising symptoms. No. 432 is a case of Melanotic Sarcoma scattered throughout the Brain Tissue, the largest deposit occupying the left occipital lobe (cuneus). The patient suffered from paroxysms of flashes of light in the right eye. The history was interesting as showing that apparently innocent pigmented moles may become malignant, for the patient had a pigmented mole on the right shoulder which remained of the size of a three-penny-piece until it was injured at the age of ten years, when it started to grow. When the patient was twenty-one years it had enlarged to the size of half-a-crown and was removed by scraping, but it recurred and was again excised at the age of twenty-five years. The following year she manifested symptoms of intra-cranial tumour and she died at the age of twenty-six years. Nos. 434 and 435 are two specimens of Tumour of the Pituitary Body. The tumours were as big as a small and large plum respectively; one was solid throughout, the other appeared cystic in parts. No symptoms of acromegaly were present in either patient during life. The first was a girl, aged twenty-one years, and the only lesion found after death was a great enlargement of the pituitary body. The earlier symptoms of the illness, which lasted five years, were gradually increasing blindness, occasional headaches, and vomiting; the later symptoms consisted of atrophy of the optic discs, increasing headache (occipital), vomiting, and giddiness; the termination was by coma. Nos. 439 and 433 are two cases of Tumour of the Cerebellum without any paralysis or other localising symptoms during life. One was a female, aged sixty-four years, in whom there existed a sarcomatous tumour of the dura mater of the size of a plum, deeply indenting the left lateral lobe of the cerebellum. No symptoms of *any kind* referable to cerebellar tumour were observed during life except that she died from convulsions. She had mitral disease and dropsy and seven weeks before death had "a stroke" followed by right hemiplegia due to a small hæmorrhage in the left lenticular nucleus. The other case was that of a woman, aged sixty-one years, in whom there existed a cancerous nodule in the right lobe of the cerebellum and a smaller one in the left lenticular nucleus secondary to cancer of the breast. There had been no paralysis during life or other localising symptoms; only optic neuritis, headache, and the other general symptoms. No. 439A showed 4 Scrofulous Tumours in the Cerebellum, 3 in the left and 1 in the right lateral lobes; they occurred in a male patient aged seventeen years. There was very slight weakness of the right side, but no definite paralysis, no alteration of gait, or other localising symptoms; there were double optic neuritis, headache, giddiness, &c. He died after a six-months' illness. No. 437 represented a Perforated Sarcoma of the Skull in a boy, aged four years, in whom a lump had been noticed over the vertex only twelve weeks before death. The foregoing were all exhibited by Dr. Byrom Bramwell. Cerebral Tumours were also exhibited by Dr. Alexander Bruce, Dr. George Murray, Dr. W. G. Richardson, Dr. David Drummond, and others. It seemed a pity that no clinical records accompanied these specimens with the exception of the last-named exhibit, since more than half of the interest lies in the associated symptoms during life.

The general conclusions to be drawn from the preceding are most valuable: 1. It is clear that tumours may occupy the motor and other regions to which well-defined symptoms have been assigned without producing those symptoms. This is specially exemplified by the two specimens under No. 439, for in one a hæmorrhage occupying the left lenticular nucleus produced right hemiplegia, but a sarcoma in the same position, although apparently destroying the nucleus, was not so attended. In slowly growing tumours it can be readily understood that the adaptability of brain matter prevents its destruction; but in rapidly growing lesions such as many of these were it can only be presumed that the remarkable power of "substitution of centres" which the brain possesses came into operation. 2. Nevertheless, from an examination of these specimens it may be concluded that cerebral tumour rarely exists even in the frontal region without producing the general symptoms—headache, giddiness, vomiting, convulsions, and optic

[1] The First Notice was published in THE LANCET of Aug. 6th, 1898.

neuritis—which have been regarded as significant of intracranial tumours.

It is appropriate that Scotland, which produced an eminent surgeon (Macewen) whose name is associated with cerebral surgery, should furnish such a rich collection of cerebral tumours; and now it is to two Scotch observers that we are indebted for the first really simple system of cranio-topography. It is perhaps strange that Chiene and Stiles's method is not better known. This Museum contained very complete series of specimens and photographs illustrating these observers' investigations and they showed conclusively how complete is the precision of their measurements for ascertaining the exact position in the cranium of any given centre in the brain. Their system is special (1) in depending on bony prominences from which straight lines are drawn, (2) without measuring angles and (3) without measuring in inches, for (with one exception) all the lines are halved to locate a convolution.

DRAWINGS AND PHOTOGRAPHS.

A very beautiful Series of Pictures illustrative of almost the entire range of clinical medicine is to be found in Dr. Byrom Bramwell's original plates (coloured and photographic), from which his "Clinical Atlas" was prepared. They occupied half the entire side wall of the Museum—a space measuring 50 ft. by 10 ft. Among the subjects illustrated are Ichthyosis, Lupus Vulgaris, Lupus Erythematosus (one of the most life-like representations imaginable), Anæsthetic Leprosy, Psoriasis of the Palms, Black Jaundice, Scurvy, Purpura Hæmorrhagica, Cyanosis, Thoracic Aneurysm, Myxœdema, the Clubbed Fingers of Congenital Heart Disease, Chlorosis, Addison's Disease, and the Expression in Various Forms of Mental Disease. In all a perfect type of the disease has been taken and the completeness of the collection is evidenced by two plates illustrating two patients affected with the epidemic skin disease which occurred in London in 1891 and occupied a good deal of professional attention at the time.

A radiograph measuring 30 in. by 18 in., by Dr. John Macintyre (of Glasgow), representing a case of Transposition of the Viscera, makes us hope once more that we may some day be able to detect hypertrophy of the heart and the outlines of other solid viscera by means of the x rays.

DERMATOLOGY.

Among the most notable changes which have taken place in this department of general medicine during recent years is the reclassification of bullous and vesicular eruptions. Formerly everything bullous was called pemphigus, but owing to the researches of Unna, Duhring, and others a new group, named Dermatitis Herpetiformis, has been sorted out of the pemphigus class, which is characterised clinically by the bullæ varying very widely in size and occurring in clusters. The most interesting of a set of pictures exhibited by Dr. Allan Jamieson illustrate the 3 principal varieties in which this disease occurs—viz., (*a*) the Erythematous, (*b*) the Vesicular, and (*c*) the Bullous forms of Dermatitis Herpetiformis. Among the other subjects illustrated by this exhibitor are the following: Lichen Scrofulosorum; Angio-keratoma; a very curious warty, horny, or fungating condition on the arm which the exhibitor has named Paraffin Ichthyosis; Tinea Tonsurans around the anus simulating a mucous tubercle; and a case called Acanthoma of the Leg—an extensive warty or tuberculous thickening suggesting some strumous affection or granuloma fungoides. Dr. Radcliffe Crocker exhibited a remakable series of Ten Drawings showing the various stages (though not taken from the same case) of that rare condition Mycosis Fungoides. The first and most important stage of this disease may often take a form resembling psoriasis or eczema or pityriasis rubra, each of which is here represented. In any case it is purpuraceous and may have a raised scurfy edge. This is followed by the tumour stage, which the exhibitor likens to pityriasis rubra, and finally the stage of ulceration. Mr. Malcolm Morris and Professor McCall Anderson also exhibited sets of Dermatological Sketches and Dr. Norman Walker showed a series of Microscopic Sections in the same subject.

GENERAL PATHOLOGY.

From the Museum of the Hospital for Diseases of Children comes an admirable collection in illustration of Hydrocephalus; Gummatous, Tuberculous, and Rachitic Lesions; and Congenital Heart Disease. Perhaps the most interesting specimens in this series are the gastric ones, which include three stomachs, the seat of congenital hypertrophy of the pyloric and stomach wall, taken from children aged twenty-eight days, forty-eight days, and nine and a half weeks respectively—a rare and interesting condition. Unfortunately the associated symptoms are not mentioned.

Dr. Alexis Thomson (Edinburgh) exhibited Shoulder-joints almost totally disorganised from a case of Locomotor Ataxy, and another from Syringomyelia. It is only of late years that we have learned the last-named association and our readers will recollect a very remarkable case of extensive disorganisation of the shoulder-joints which was regarded by a committee of the Clinical Society as the result of chronic pyæmia, but which was proved post mortem to be due to syringomyelia.

Apparatus for Serum Diagnosis were exhibited by Dr. H. E. Durham and Dr. Robert Muir (Edinburgh). A neat little contrivance for Vidal's Sero-sedimentation Test for Typhoid Fever was exhibited by Dr. D. H. Hutchinson (Edinburgh). The test depends on the fact that if a patient be suffering from enteric fever some of his serum when added to broth containing enteric microbes cause the latter to agglutinate into little bundles and fall into a sediment. The apparatus exhibited is practically two U-tubes cemented together. In one the suspected blood is placed; the other contains some normal serum treated in precisely the same way. Thus we have a control experiment and the test side by side. Some excellent photographs of the experiments (which form the basis of the exhibitor's M.D. thesis) are also shown.

Microscopic sections illustrating the extremely minute microbe of the Pictou Cattle Disease,[2] a disease believed by the exhibitor[3] to resemble a form of cirrhosis of the liver in man, were shown by Professor Adami (Montreal). Dr. Graham Brown showed a series illustrating various forms of Cirrhosis of the Liver in the Human Being.

Dr. Greenfield exhibited a Series of Entire Sections of Organs of Microscopic Thickness. The sections are placed between two plates of glass measuring about 12 in. by 8 in. In this way the observer is enabled to study, either macro- or micro-scopically, pulmonary apoplexy, chronic phthisis in its various stages of deposit, softening, and cavitation, acute miliary tuberculosis, a chronic thickening of the pleura measuring about ¾ in. thick, supposed syphilitic interstitial pneumonia, septic nephritis, infarct of kidney, plastic cast of bronchitis, broncho-pneumonia, and miners' anthracosis.

That rare condition Achondroplasm was illustrated by Dr. Alexander Bruce (Edinburgh), who showed an excellent Plaster Statue. Photographs, skiagrams, and bottled preparations were also shown by Dr. John Thomson and Dr. Harry Rainy. The disease consists of a delayed ossification of the bones and delayed development of the muscles and soft parts. It resembles rickets in some respects and is probably the cause of dwarfism. The most characteristic feature of this disease is the face, by means of which it can be recognised—forehead broad, nose flat or undeveloped, and lips thin. Puberty is delayed and the body, strange to say, may continue to develope up to the age of thirty-five years. The celebrated Tom Thumb and his wife were probably examples of this condition.

THE ANNUAL MUSEUM.

(Continued from page 380.)

III.—SANITARY APPLIANCES, DISINFECTANTS, &c.

Under this heading we may deal with disinfectants, antiseptics, filters, and so forth. A special space was allotted in a small hall adjoining the Drill Hall to what was described as a sanitary department, but this related, with the exception of a working model of the septic tank system of treating sewage at Exeter, to the furniture of hospitals, illustrations of aseptic wards, operating theatres and dental operating accessories rather than to public sanitary matters. With this section we shall deal in Division IV. under the heading of Surgical Instruments and Appliances. The Working Model of the Tank System of Sewerage Treatment, which is shortly to be carried out on a scale applied to the whole city of Exeter, evoked considerable interest. Specimens of sewage before and after treatment were submitted for inspection. Turning to methods for

[2] See the paper by Professor Adami on p. 396 of this issue, as a special supplement to which reproductions of these sections are published.
[3] Vide Report of the Medical Section, THE LANCET, July 30th, 1898.

combating organisms rather than encouraging their growth we may appropriately refer to the exhibit of Messrs. J. Defries and Sons (147, Houndsditch), whose representatives demonstrated the many industrial as well as scientific applications of the Pasteur (Chamberland) Filters. There was a Plan of the Waterworks Filter at Darjeeling of which the output is 250,000 gallons per day, and close by was a photograph illustrating the working of the Equifex disinfector as used in Bombay harbour, the temperature attained being 239° F., while a useful instrument in sanitary work was Dr. Scurfield's Ventilation Indicator, showing the ratio of carbonic acid inside and outside dwelling rooms. The stall of the Sanitas Co. (Bethnal-green, E.) was loaded with the great number of disinfectants, antiseptics, and disinfecting appliances now associated with this firm. In addition to the many excellent preparations of which the pleasant and active compound Sanitas is the basis there were shown also the convenient Sulphur Fumigating Candles, Mercuric Bactericide, and "Okol," a powerful and comparatively non-poisonous germicide and a coal-tar derivative. We have already referred in our analytical records to the somewhat remarkable claims put forward by the Amiral Soap Syndicate, Ltd. (28A, Basinghall-street, E.C.), in favour of Amiral Soap. Its application is said to lead to a distinct reduction of adipose tissue. It contains, as we have shown, the active physiological ingredients of ox-gall. The comparatively new antiseptic and disinfectant, Izal, the special medical preparation of which is stated to be four times as strong as absolute phenol, is increasing in favour. At the stall represented by Messrs. Newton, Chambers, and Co., Ltd. (Thorncliffe, near Sheffield), the following Izal specialities were shown: the izal vaporiser, pure izal oil, izal surgical dressings, and izal toilet preparation. Not the least advantage of izal is that though a powerful germicide it is practically non-poisonous. The interesting substance Formalin was exhibited in several forms by the Formalin Hygienic Co., Ltd. (9 and 10, St. Mary-at-Hill, E.C.). Paraform tablets are especially convenient for obtaining the formic aldehyde gas for disinfecting purposes. These are used in conjunction with the "alformant" lamp. For disinfecting on a large scale Trillat's autoclave may be employed, the gas being generated from a mixture of formalin and chloride of calcium (formochloral). Lastly, "glutol" is an antiseptic powder for dressing wounds and is described as the condensation product of formic aldehyde with gelatin. Some very useful Sanitary Soaps were presented for inspection on the stall of Messrs. Price's Patent Candle Co. (Belmont Works, Battersea, S.W.). Thus there were in addition to glycerine soaps combined with well-known antiseptics "Price's Surgeon's Soap" for use in gynæcology. It contains 2 per cent. corrosive sublimate combined with certain aromatic antiseptics, such as thymol and gaultheria, &c. The "aseptic soap" offered by this firm contains also aromatic antiseptics and is extremely pleasant to use. "Creolin" is a well-known disinfectant and antiseptic, the derivation of the word being obvious. The Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, E.C.), were the pioneers of this class of compound, which has now been applied to a great variety of useful purposes. Thus on the stall, which was admirably planned, were besides the ordinary creolin compounds, creolin surgical dusting powder, creolin capsules, and creolin gauze. "Antiseptic preparations" formed an important group in the exhibit of Messrs. C. J. Hewlett and Son (40 to 42, Charlotte-street, E.C), amongst them being a disinfecting fluid of powerful germicidal properties, which while more powerful than carbolic acid, is in comparison with it practically non-toxic. Further obviously useful preparations are also the Antiseptic Jellies, Pellets, and Cream. Not far off was the Ronuk Sanitary Polish (Ronuk, Ltd., 84, North-street, Brighton). This preparation was by no means out of place in the Museum, since it is admirably adapted as a sanitary polish for the flooring of hospital wards. It contains certain aromatics which impart a pleasing, wholesome odour to the surroundings. Lastly, under this section may be mentioned the exhibit of Messrs. Tidman and Sons, Ltd. (Bushell-street), which was devoted mainly to their well-known Sea Salt, which is said to have been the first offered to the public for bath purposes. In the same group was a soap which is compatible with salt or hard water and an antiseptic soap containing salicylic acid in conjunction with other agents as its antiseptic basis.

IV.—Surgical Instruments and Appliances.

This was a department which served eminently to illustrate the remarkable advances of surgery in recent years. The perfection of detail and of design in the instruments at the disposal of surgeons has helped in bringing to a successful issue some of the wonderful surgical achievements of the day. The excellent display of surgical requisites, besides offering a field of instruction, served well from the mere point of view of decoration to relieve the lines of bottles and packets on the other stalls. Considerable discretion had evidently been exercised in separating, as far as conveniently could be done, the exhibits of a like character; and steel instruments, chemical apparatus, electrical apparatus, and so on, were employed usefully and artistically in filling the gaps. A very interesting apparatus, and one which aroused considerable curiosity and attention, was that demonstrated by Dr. Robertson of Cincinnati at Messrs. Allen and Hanbury's stall (48, Wigmore-street, W.). It consists of what is called "the Pneumachemic Comminuter and Compressed Air Apparatus." A number of aspirating globes are situated upon the top of an air container, which is charged by means of an air pump. The globes contain various medicaments of value in the treatment of the respiratory organs. The apparatus effects the vaporisation of these as a very fine spray which is dry and under perfect control. By an ingenious arrangement of the valves a rapid intermittent current of atomised substances may be administered. Close by was a separate stall of the same firm devoted to an excellent assortment of surgical instruments. Amongst these should be mentioned Hoppe's patent Universal Adjustable Splint, Perforated Metal Splints, Scalpels, and Bistouries, the latter being supplied with plain handles or the improved fluted-edged handles. In the Sanitary Section Messrs. Down Brothers (St. Thomas-street, S.E.) exhibited their well-known Aseptic Furniture for Operation Theatres, including their patent Glass Tables and Operation Tables. On their stall in the main hall was a very large collection of Surgical Instruments, several novelties present securing considerable interest from the professional visitors. Aseptic Operating Tables and a Combined Dental Chair and Surgical Operating Table were the chief features of the exhibit of the Medical Supply Association (Edinburgh and 228, Gray's Inn-road, London, W.C.). An enormous Induction Coil was included accompanied by the usual accessories of x ray work and including some recent developments in practical detail. The Spring Bedsteads for hospital use designed by Mr. Lawson Tait were the special exhibit undertaken by Messrs. George Gale and Sons (Birmingham), while close by Messrs. Billington Brothers (Liverpool) had arranged for inspection several well-designed Beds for the Use of Invalids. Near the same space were examples of Theatre Furnishings by Messrs. Arch. Young and Son (Edinburgh). To return to the main hall the Walker Bed for Insomnia was bound to attract interest since at times it was kept in a very gentle rocking movement by means of simple and easily managed hydraulic machinery. It is said to have been employed with excellent effects in cases of insomnia and restlessness. It is the invention of Mr. J. H. Walker (Hartwood, West Calder). A very interesting collection of Hospital and Invalid Appliances was shown by Mr. W. Martin (121, George-street, Edinburgh). The working of an ingenious apparatus for the production of a purely dry heat by electric current for the alleviation of pain in the case of enlarged or stiffened joints, or in gout, rheumatism, and sciatica, was demonstrated by its designer, Mr. Greville (32, Upper Berkeley-street, W.C.). The apparatus is quite simple to manage and consists of a jacket adaptable to the limbs, abdomen, or neck lined with resistance coils. Any desired temperature may be obtained, that usually employed being near 300° F. Biological and Chemical Apparatus for laboratory use formed the subject of exhibit of Mr. B. H. Baird's stall, and also a variety of Glass Jars for anatomical and other specimens were shown. A large collection of similar appliances, such as preparation jars, pathological trays, botanical jars, and glass urinals, were displayed by Messrs. John Ford and Co., the well-known glass manufacturers and china purveyors, of Edinburgh and 33, Holborn-viaduct, London, E.C. Some excellent Designs in Medical Sprays and Atomisers were shown by Mr. Frank A. Rogers (late Corbyn and Co., 327,

Oxford-street, W.) as well as Inhalers, Douches, and Several Pharmaceutical Preparations. Close by were the Optical Instruments and Spectacle Lenses which are a specialty of Mr. George Culver (White Lion-street, Pentonville N.). The Liverpool Lint Co.'s stall (Netherfield-road North, Liverpool) was replete with Lints, Bandages, Padding, and Cotton Wools, all of excellent service for surgical dressing, and as specialities may be mentioned the Carbolised Tow and the Surgeon's Tow. The stall of Messrs. C. T. Maling and Sons (Ford Potteries) was devoted to special hospital and private Nursing Requisites in Earthenware. The Sanitary Preparations of the Sanitary Wood Wool Co., Ltd. (26, Thavies-inn, Holborn-circus, E.C.), are well known and deservedly recognised as valuable absorbents. Amongst those shown were wood-wool wadding and tissue, antiseptic and absorbent, sanitary wood-wool sheets for accouchement, hygienic towelettes, antiseptic sponges, &c. A standard collection of Surgical Instruments (aseptic), Operating Tables, and Theatre Fittings was that of Messrs. John Weiss and Son (287, Oxford-street, W.), and the exhibitors were constantly assured of the interest taken in their exhibits by the attention given to them by medical visitors. What is described as a natural antiseptic and deodorant wool and called Bèraudine was shown applied to a variety of surgical dressings by Messrs. Brion, Paté, Burke, and Co. (15, Walbrook, E.C.). A most comprehensive assortment of special Surgical Appliances, all said to be manufactured in the latest aseptic models, were tastefully arranged on the stall of Messrs. J. Gardner and Son (32, Forrest-road, Edinburgh), and near was a collection of Listerian Surgical Dressings, Gauzes, &c., and Catgut Ligatures and Sutures by Messrs. J. F. Macfarlan and Co. (Edinburgh, and 9 and 11, Moor-lane, London, E.C.). The exhibit includes the well-known specially purified chloroform and ether of this firm. The stall of Messrs. Baird and Tatlock (Edinburgh, and 16, Cross-street, Hatton-garden, London) contained an interesting collection of Bacteriological, Chemical and Physical Apparatus. Amongst these were x ray apparatus and the vacuum tubes of helion and argon used by Professor Ramsay and Lord Rayleigh in their interesting investigations. Mr. Harry Cox, of 10 and 28, Cursitor-street, Chancery-lane, exhibited his well-known effective x ray outfit, including several powerful coils of exclusively English make, and improved fluorescent screens. He demonstrated also a means of intensifying the x ray negative. On the stall were some of the best x ray photographs we have seen. Mr. Cox personally superintends the winding and insulation of his induction coils with very satisfactory results. Moreover they are moderate in price and give a maximum spark length with a minimum of battery power. A novel Design in Hospital Construction was shown by Mr. Henry Greenway. The mode of construction is especially designed for the adaptation of the hospital to receive surgical, medical, or lying-in cases, or to be used as a fever hospital. Further, three kinds of infectious cases can be isolated from each other although admitted in equal or unequal numbers, or the entire range of wards can be used for the reception of patients suffering from one disease alone. The particulars of construction, mode of ventilation, heating, and the means by which the infected air may be rendered innocuous are well worth attention. The designer is the consulting medical officer of health of the county borough of Plymouth. The marvellous tensile strength of Longford wire as applied to a hospital bed carrying one ton weight was shown by the company (Warrington). On the same stall were specimens of Wood's Patent Galvanised Woven Wire Saddles, which are said to prevent saddle-soreness and to reduce vibration to a minimum. Close by were the microscopes and other optical apparatus of Messrs. Ross, Ltd., whose name has long been associated with excellence in manufacture of lenses. Similar apparatus was shown by Mr. J. Lizurs (2 and 4, Maitland-street, Edinburgh), one very interesting exhibit being the "Kromscop" for showing Ives's beautiful method of photography in colours. The Globe Nebuliser for producing a remarkably fine spray was shown in action at the stall of Messrs. Oppenheimer and Co. (Victoria House, Victoria-embankment), a new feature connected with it being a detachable aseptic pneumatic mask, which allows complete sterilisation and thus prevents the communication of infection when transferred from one patient to another. On the same stall was a Universal Vaporiser and a new Hypodermic Case with some important features in design and arrangement. Mr. Schall (55, Wigmore-street, W.) was constantly employed in demonstrating the working of his electrical apparatus for galvanisation, electrolysis, faradaisation, cauterising, &c. The batteries and instruments employed for illuminating the mouth, nose, ear, throat, rectum, vagina, urethra, and bladder were evidently highly appreciated by those interested. Messrs. Harvey Hilliard and Son (7, Nicolson-street, Edinburgh) showed a very wide range of Surgical Appliances, artery forceps (Wakley), craniotomy forceps and ovum forceps being amongst the exhibits. Next was the stall of Messrs. J. B. Hilliard and W. B. Hilliard and Sons (65, Renfield-street, Glasgow), worthy of particular mention being the Talipes Boot of Macewen, the Correcting Boot of McVail, and Hilliards' Spinal Evertor and Artificial Spine. Lastly, the well-known specialties of Messrs. Robinson and Sons (55, Fann-street, Aldersgate-street, E.C.), including their Special Tissue, Gamgee Tissue, Dressings, &c., may be taken as examples of the care which is bestowed by the manufacturers in affording the surgeon every chance of success that is possible as regards the treatment of wounds and suppurating surfaces.

Medical News.

EDINBURGH UNIVERSITY.—The following candidates were successful at the recent first, second, and third professional examinations in Edinburgh University for degrees in medicine and surgery:—

First Professional Examination.—R. G. W. Adams, Lewis Anderson, M. F. Anderson, R. G. Archibald, N. H. Beath, Edward Bennett, William Bennett, William Blackwood, E. A. Braine (M.A.), G. B. Brand, J. G. Briggs, J. E. M. Brown, H. H. Bullmore, C. M. Campbell (M.A.), K. A. Cappie, Alec Carruthers (M.A.), J. W. Cathles, A. M. Caverhill, P. D. Cremona, C. W. C. Crooke, H. L. Cumming, Sam Cunliffe, Jan Dommisse, John Dunlop (with distinction), Percy El-Karey, J. S. Elliott, S. C. Ellison, John Fairbairn, A. N. Fell, B. P. Ghose, C. M. Gillespie, E. C. Gimson, A. M. Gloag, R. G. Gordon, Andrew Grant, J. A. Grey (M.A.), T. B. Hamilton (with distinction), D. J. Hamman, Howard Harding, A. W. M. Harvey, A. W. Hauman, George Henderson (M.A.), Henry Herd, J. T. Hill, T. J. Hofmeyr, R. B. Hole, Matthew Holmes, J. M. Johnstone, J. N. Karma, J. P. Kennedy, Harold Kerr, R. D. Kidd, E. A. King, H. A. Knight, Hermann Kramer, G. I. Lecesne, Norah Lenwood (with distinction), William Lilico, J. C. London, R. C. Low, T. S. M. Lumsden, W. F. MacDonald, George M'Farland (with distinction), I. N. M'Keand, George M'Neill, C. E. Marshall, J. M. Marshall, R. J. Mayberry, B. L. Meynell, Thomas Mill, W. S. Milne, A. M. Moll, G. I. Moriarty, A. E. Morton, R. S. Munro, A. E. Nalborough, Charles Nelson, A. L. Nestor, Claude O'Flaherty, T. H. Osler, T. C. E. Parry, E. P. B. Phillips, J. H. H. Pirie, A. M. Pringle, J. A. Raubenheimer, J. J. Redhead, Charles Reece, A. B. dos Remedios, R. A. C. Rigby, H. H. Roberts, Alexander Rose, F. E. Ross, R. E. Russell, J. S. Sewell, J. J. Shannon, R. S. Sharpe, Meurice Sinclair, W. F. Smeail, J. M. Smith, R. W. Smyth, D. W. Standley, J. P. Steven, H. M. Stumbles, G. A. J. Tait, A. B. M. Thomson, Philip Vickers, J. F. van de S. de Villiers, Edwin Wells, W. C. P. White, Harry Whittaker, George Wight, S. A. K. Wilson (M.A.), and W. Y. Woodburn.

Second Professional Examination.—V. G. S. Adams, Robert Affleck, Henry Alexander, C. H. Allen, E. M. Anderson, M. S. Anderson, W. L. G. Anderson, R. H. S. Aylward, A. J. Baird, F. A. F. Barnardo, M.A., J. H. Bell, L. N. Bigg, Lancelot Bruce, G. B. Butt, Ewen Cameron, J. P. Campbell, G. S. Carey, H. L. Clift, W. J. Collinson, A. D. S. Cooke, Leonard Crossley, G. A. Davidson, Archibald Dods, J. P. Douglas, Edward Ewart, Charles Fraser, Yoshinobu Fukuda, A. W. Fuller, O. A. Gee, J. C. Gilchrist, Norman Glegg, J. L. Green, Robert Hamilton, Frederick Hardie, Eleanor Hodson, L. G. Hood, A. J. Hughes, D. B. B. Hughes, F. F. C. Jagger, J. G. S. Jamieson, M.A., John Jamieson, J. M. Jeffrey, J. C. Kennedy, P. K. Kerr, H. C. Keun, S. M. de Kock, A. C. Lemle, G. H. Lewis, G. A. Lowther, D. J. M'Adam, R. J. M'Clelland, J. G. M'Dougall (with distinction), W. J. M. M'Farlane, W. R. M'Farlane, J. H. M'Kee, J. G. Mackenna, D. M. Macleod, Elizabeth Macrory, K. D. Melville, H. C. Miller, J. B. Milne, M. C. Morgan, Florizel Myers, J. C. Parker, Peterswald Pattison, C. B. Paul, M. C. Pepper, D. E. Pratt, J. B. Primmer, J. R. Prytherch, Samuel Rattray, J. L. Rentoul, O. L. Rhys, C. M. Richardson, C. H. G. Ritter, D. J. Roberts, Alexander Robertson, John Ross, M.A., Richard Rutherford, L. S. Sandeman, J. B. Scott, B.A., S. R. Sibbald, William Sloss, J. A. Smaill, H. O. Smith, H. M. Speirs, A. D. Spence, Bernard Stracey, C. P. Strong, K. H. H. Uffman, N. N. Wade, William Wallace, P. D. Whiriskey, Garnett Wright (with distinction), and J. H. Wrightson.

Third Professional Examination.—F. A. F. Barnardo, M.A., L. D. H. Bough, J. A. Black, H. W. Boreham, J. M. Buist, E. A. Burroughs, G. J. R. Carruthers, Morden Carthew, C. S. Clark, H. E. Coghlan, W. J. Collinson, J. D. Comrie, M.A., B.Sc., S. L. Dawkins, Y. A. Djedjizian, D. R. Evans, D. J. Fergusson, B. K. Goldsmith, C. H. G. Gostwyck, A. N. de Gruchy, George Haddow, W. D. S. Harrison, P. H. Henderson, W. E. Herbert, John Jeffrey (with distinction), H. C. Keun, Clarence King, C. G. S. Leeds, George Lyon (with distinction), W. J. M. M'Farlan, E. W. Martin, R. G. D. Menzies, M. J. Menzies, James Miller, H. A. D. Moore, S. H. Morris, Alexander Mouat, A. C. Neethling, T. E. Richards, David Robertson, A. A. Robinson, William Rogers, J. M. Ross, A. B. Slater,

W. C. Spooner, H. B. Sproat, Bernard Stacy, Koh Leep Teng, George Thomson, W. G. Thompson, J. B. Thorburn, Alexander Tweedie, and W. G. Williams.

APOTHECARIES' HALL OF IRELAND.—At the July Examination the following candidates passed in the subjects indicated:—

Chemistry.—William Long and E. A. Reilly.
Physics.—E. A. Reilly.
Anatomy.—First Examination: E. A. Reilly. Final Examination: W. P. Harding and Lewis J. Farell.
Physiology and Histology.—R. Tichborne.
Forensic Medicine.—Frederick A. Bass.
Hygiene.—Frederick A. Bass and Wm. P. Harding.
R. Tichborne and Wm. P. Harding have completed the second professional examination and Frederick A. Bass has completed the third professional examination.
Conjoint with the Royal College of Surgeons in Ireland.—Final Examination: Edward Patrick Eustace and Philip John Murphy.

At the annual meeting of the Governor and Council of the Apothecaries' Hall of Ireland convened by the Act of Incorporation on August 1st the following were duly ballotted and elected to hold office for the ensuing year ending July, 1899: Governor, Mr. James Raverty; Deputy-Governor, Mr. Hugh A. Auchinleck; Council, Mr. John Evans, Mr. W. Furlong, Dr. T. D. Finucane, Dr. J. A. Johns, Mr. R. Montgomery, Mr. Robert John Montgomery, Dr. Charles F. Moore, Dr. Christopher M. O'Brien, Dr. O'Flaherty, Mr. J. Shaw, Mr. Stritch, Mr. S. M. Thompson, and Mr. C. R. C. Tichborne; Representative on the General Medical Council, Mr. C. R. C. Tichborne; Secretary, Mr. Robert Montgomery.

FOREIGN UNIVERSITY INTELLIGENCE.—*Bordeaux:* Dr. Lefour, *professeur-agrégé*, has been appointed to the chair of Clinical Midwifery.—*Cairo:* Dr. S. G. Toller has been appointed Professor of Medicine and Dr. Madden and Mr. Milton, Professors of Surgery.—*Granada:* Dr. Antonio Amor y Rico has been appointed Professor of General Pathology and Dr. José de Paso y Fernandez Calvo Professor of Hygiene.—*Lille:* Dr. Charmeil, *professeur-agrégé*, has been appointed to the chair of Clinical Dermatology and Syphilis; Dr. Calmettes has been appointed to the chair of Bacteriology and Experimental Therapeutics.—*Ohio Medical College:* Dr. B. K. Rachford has been appointed Professor of Materia Medica and Therapeutics in succession to Dr. Nieldes, who retires with the rank of Emeritus Professor; Dr. Poole, Professor of Chemistry, has been appointed to the Chair of Physiology.—*Philadelphia Medico-Chirurgical College:* Dr. G. M. Boyd has been appointed Professor of Clinical Midwifery.—*Siena:* Dr. Andrea Cristiani has been recognised as *privat-docent* of Psychiatry.—*Utrecht:* Dr. Katherina von Tusschenbroek has been appointed to the Chair of Gynæcology.—*Würzburg:* Dr. Richard Geigel has been appointed Extraordinary Professor of Balneology.

PRESENTATION TO A MEDICAL MAN.—Mr. J. J. McGrath, L.R.C.S. Irel., of Lower Mount-street, Dublin, was presented by his many friends on July 21st, on the occasion of his marriage, with an illuminated address setting forth the esteem in which he is held and also with a silver tea and coffee service.

LIME WATER.—At the Caerleon (Monmouthshire) Petty Sessions on July 29th a grocer was fined £4 10*s.*, including costs, for selling lime water deficient in lime. The county analyst stated that the water should have contained twice the amount of lime that he had found in it.

GREAT NORTHERN CENTRAL HOSPITAL.—Sir John Dickson Poynder, Bart., M.P., has been elected chairman of the Committee of Management of the Great Northern Central Hospital, in succession to the late Mr. C. T. Murdoch, M.P.

THE VACCINATION QUESTION.—At the meeting of the Plympton (Devon) Board of Guardians held on July 29th it was decided, by 15 votes to 9, on the motion of Mr. C. Aldridge, M.D., C.M. Aberd., L.R.C.P. Lond., that the board were in favour of the compulsory clause in the Vaccination Acts still operating.

EMSWORTH VICTORIA COTTAGE HOSPITAL.—On July 23rd this memorial of the Queen's Diamond Jubilee was opened by Sir Samuel Wilks, Bart., M.D. Lond., F.R.S., President of the Royal College of Physicians of London. Since 1887 the work has been carried on in a cottage with 4 beds, rented at £16 a year. Over 300 in-patients have been treated, 54 of whom were suffering from accidents, and 46 operations have been performed, and this without incurring any debt. For the last three years the average cost per head per day, including maintenance, nurse, and rent, has been 2*s.* The present hospital for seven beds, designed by Mr. John Birch, 8, John-street, Adelphi, has been erected at a cost of £1500 and is very convenient in its arrangements. It consists of a first floor on which are two wards of three beds each and the matron's bedroom, and a second floor with a small special ward of one bed, bathroom, servants' room, and operating-room, admirably lighted and equipped. The honorary consulting staff are Dr. Goodhart and Mr. W. H. A. Jacobson; the honorary medical officer is Mr. Lockhart Stephens. After a careful inspection Sir Samuel Wilks expressed his entire approval of the design and arrangements.

ASSAULT ON A MEDICAL MAN.—Mr. Richard Harding, L.R.C.P. Edin., L.F.P.S. Glasg., vice-chairman of the Radnorshire County Council and medical officer of health of the New Radnor Rural District Council, was violently assaulted on the evening of Aug. 1st. Mr. Harding was riding a bicycle to visit a patient, when the lamp went out and he went to a cottage to endeavour to get a light, but being unable to make anybody hear was turning away when he was attacked from behind and seriously injured. Medical aid was fortunately obtained. An arrest has been made.

THE Eleventh Universal Cookery and Food Exhibition will be held in the galleries of the Imperial Institute in the month of March, 1899. The exhibition will, as heretofore, be under the auspices of the Universal Cookery and Food Association, and the chairman of the Executive Council of the Exhibition will be Mr. J. C. Buckmaster, whose association with the cause of cookery is historical. The offices of the Executive Council are 329, Vauxhall-bridge-road.

LUNACY IN DORSETSHIRE.—Although the new county asylum at Charminster has only been completed about two years the Dorset County Asylum Committee has been informed by the Commissioners in Lunacy that owing to the increase of lunacy the available accommodation will be exhausted in five years, and the county is asked to take the matter into early consideration in view of making additional provision. During the past year the percentage of new admissions has been very high.

MR. J. A. CAMPBELL, M.D., C.M. Glasg., F.R.S. Edin., on his recent retirement after over thirty-one and a half years' service as a medical officer and upwards of twenty-five years as medical superintendent of the Counties Asylum at Carlisle, has been appointed an honorary consulting physician to the institution; and Mr. W. F. Farquharson, M.B., C.M. Edin., after seven years' service as a medical officer to the asylum, has been promoted to the office of medical superintendent.

MORETONHAMPSTEAD CONVALESCENT HOME.—The new wing of the Moretonhampstead Convalescent Home was opened on Aug. 3rd by Mrs. Mallock. This home, founded by the Misses Phillips in 1872, at first had only accommodation for 14 people, but it was enlarged in 1879. Last year 156 patients were admitted. The new wing has been erected at a cost of about £800, of which sum the Misses Phillips have subscribed £300. About £200 is still required to free the home from debt.

MONMOUTHSHIRE COUNTY COUNCIL.—At the meeting of the Monmouthshire County Council held on Aug. 3rd it was resolved, on the motion of Sir Henry Jackson, Bart., to appoint a committee for the purpose of acquiring the historic ruins of Tintern Abbey and Raglan Castle for the county.—At the same meeting it was stated that temporary buildings were to be added to the county asylum to accommodate 50 patients of each sex. The cost of the erection would be £3400 and the furnishing £1494 in addition.

CORPORATE AND MEDICAL REFORM ASSOCIATION, LIMITED.—At a recent local meeting at Oldham of this association, Dr. James Corns (Oldham) being in the chair, in addition to the chairman and Mr. Platt, J.P., Mr. Martland, Mr. Fort (honorary secretary), Mr. Kershaw, Dr. Lendrum, and Mr. W. B. Yates were appointed members of the Oldham Local Committee. It was resolved prior to the

great Lancashire centres being approached in favour of the promotion of a County of Lancashire Branch of the Association to take active measures in Oldham and the neighbourhood to propagate the policy and extend the membership of the association and to hold a general meeting after the holidays.

CONGRESS OF HYDROLOGY, CLIMATOLOGY, AND GEOLOGY.—The fifth International Congress on Potable Waters, Mineral Waters, and Medical Climatology and Geology will be held at Liège from Sept. 25th to Oct. 3rd under the patronage of the Crown Prince of Belgium. There will be receptions by the municipalities of Liège, Spa, and Aix-la-Chapelle, and visits will be paid to various places, including Ostend, Middelkerke, and Wenduyne. The congress committee will be pleased to offer to all the foreign members a free railway-ticket throughout the whole of Belgium for this Ostend excursion from Liège. Members will obtain a reduction of 50 per cent. on all railway fares throughout Belgium. The subscription to the congress is 16*s.* for gentlemen and 8*s.* for ladies and university students. Communications intended for the congress should be sent before Aug. 25th to Dr. G. Jorissenne, general secretary, 130, Boulevard de la Sauvenière, Liège, Belgium.

Parliamentary Intelligence.

HOUSE OF COMMONS.

THURSDAY, AUGUST 4TH.

The Preparation of Calf Lymph.

MR. HEDDERWICK asked the President of the Local Government Board whether the calves from which the lymph was to be derived, under the provisions of the Vaccination Bill, would be slaughtered after use and the carcasses exposed for sale in the meat markets.—MR. CHAPLIN replied: I have already stated more than once that every calf used for the preparation of glycerinated lymph will be subsequently slaughtered and no lymph will be issued until both the carcass and the internal organs have been inspected by the veterinary surgeon attached to the slaughtering establishment and have been reported to be in every respect healthy. In all countries in which calf lymph has been in use during the past quarter of a century such healthy carcasses are exposed for sale, and I am not aware of anything at present that would make a different course necessary in this case.

Nursing in Workhouse Infirmaries.

MR. TALBOT asked the President of the Local Government Board what progress had been made in carrying out the requirements of the Board expressed in their orders of August, 1897, urging boards of guardians to employ trained nurses only in their infirmaries; and whether it was within the knowledge of the Board that many boards of guardians had found great difficulty in obtaining the services of such nurses; and, if so, what steps the Local Government Board proposed to take to supply them.—MR. CHAPLIN replied: The order of August, 1897, provides that no person shall be appointed to the office of nurse without having had such practical experience in nursing as may render her a fit and proper person to hold the office. Since the issue of the order there has been a decided improvement in the nursing arrangements in many of the workhouses and of the nurses appointed an increasing number have been trained. I am aware that in consequence of the great demand for duly trained nurses many boards of guardians have found difficulty in obtaining the services of such nurses. The Local Government Board, however, have neither the duty nor the power to supply nurses for workhouses, but they are encouraging the training of probationer nurses at workhouses where adequate arrangements exist, who will increase the available supply in the future.

The Medical Officer of the Factory Department.

MR. TENNANT asked the Home Secretary whether he would inform the House what the duties of the new medical officer of the Factory Department would be and whether he would lay upon the table the instructions under which that officer would act and whether he had yet made the appointment.—Sir M. WHITE RIDLEY said in reply: I settled these instructions some weeks ago and shall be glad to state their effect. Briefly they are as follows. The medical inspector will reside in London and his services will be available throughout the country wherever they are required. He will conduct special and general inquiries into questions of health and safety as the chief inspector may direct; he will exercise general supervision over the work of certifying surgeons, especially where they have duties with regard to dangerous industries; he will deal with the notices of lead and other poisoning received under the Act of 1895; he will advise the staff generally on all medical questions connected with their work and will give evidence in proceedings when so directed by the chief inspector, though he will not himself institute prosecutions unless specially directed. In visiting factories, workshops, and other places he will give special attention to all matters affecting the health and safety of the persons employed; he will supply to the district inspectors particulars of any irregularities, defects, or infringements of the Acts which he may observe and also particulars of any recommendations he may make to occupiers, and he will call the special attention of the district inspectors to cases where he considers any structural alteration necessary or a prosecution desirable. He will also visit hospitals in places where industrial diseases prevail and, generally, he will act in coöperation with the other members of the staff, the certifying surgeons, and the local authorities. I have appointed to the office Dr. Thomas Morison Legge.

Water-supply of Deal.

MR. CHAPLIN, answering a question addressed to him by Dr. TANNER, said that the local authorities of Deal and Walmer had recently acquired the waterworks undertaking and were extending their mains throughout the whole district. Notices had been given to all persons having wells on their premises to discontinue the use of the wells and to lay on the water from the waterworks. Where these notices were not complied with and where the water had been found to be impure the wells had been closed and the premises connected with the waterworks main.

MONDAY, AUGUST 8TH.

Tuberculosis Commission.

MR. CHANNING asked the President of the Local Government Board whether he had now considered the portions of the report of the Tuberculosis Commission dealing with the supply of milk and the urgent necessity for strengthening and facilitating the operation of the Dairies, Cowsheds, and Workshops Order, 1885-86, with a view to secure uniformity of action and for extending the powers of local authorities to inspect dairies and byres; and whether he would by administrative order effect immediately such administrative checks to the mischiefs now existing as were possible and proceed next session to ask for the extension of the powers of the department and of local authorities as were necessary to reduce the risk from tuberculosis in milk to a minimum.—MR. T. W. RUSSELL replied to the question, saying: The numerous questions which are raised by the report of the Royal Commission on Tuberculosis are now under the consideration of the Government, both with regard to administrative orders and to legislation if necessary.

TUESDAY, AUGUST 9TH.

The Vaccination Question in Scotland.

Dr. CLARK asked the Lord Advocate whether he was aware that there had been a considerable increase of vaccination prosecutions in Scotland and that the Court of Session had decided that defaulters might be summoned every six months until the child was fourteen years old; and whether it was the case, as stated at the Dundee Sheriff's Court last week, that instructions were sent out in May by the Local Government Board, Scotland, directing prosecutions.—The LORD ADVOCATE replied: I am informed by the Local Government Board that they are not aware that there has been any such increase of vaccination prosecutions in Scotland as is suggested in the question. The Court of Session has decided that defaulters may be prosecuted so long as their names appear in the half-yearly lists transmitted by the registrars to the parochial boards (parish councils); but the Board have advised parish councils that they may use their discretion in repeating prosecutions in respect of the same child. The Local Government Board have issued no general instructions as to vaccination prosecutions. On May 23th last they inquired of the inspector of poor, Dundee, how his parish council proposed to deal with defaulters and were informed that the parish council had resolved to prosecute.—Mr. DALZIEL asked the Lord Advocate whether, in view of the legislation which had been passed this session in reference to compulsory vaccination in England, the Government would consider the advisability of suggesting to the Local Government Board in Scotland the desirability of refraining from active prosecution of conscientious objectors.—The LORD ADVOCATE replied: As I have already stated in this House the system as regards vaccination in Scotland has hitherto worked successfully and the Secretary for Scotland does not consider that any special suggestion need be made to the Local Government Board on the subject.—Mr. DALZIEL asked whether, in view of the fact that several persons were in prison in Scotland, the Government intended to allow the conscientious clause to prevail in England and at the same time to continue prosecutions in Scotland.—The LORD ADVOCATE replied: The Government intend to maintain the law in Scotland, as it is the law. Of course, if the law is altered it must be altered by Act of Parliament, but in the practical working out of the law there has never been any difficulty in Scotland, and I would hope that there would not be imported into Scotland an agitation which must be of an exotic character.—Dr. CLARK asked whether there could be prosecutions in Scotland except by the Lord Advocate or his deputies.—The LORD ADVOCATE replied: Yes, there can be prosecutions by others.

Medical Aid for the Khartoum Expedition.

MR. H. J. C. MORTON asked the Under Secretary of State for Foreign Affairs whether Her Majesty's Government would advise His Highness the Khedive to grant permission to the British Red Cross Society and to members of the Order of St. John of Jerusalem to accompany the Khartoum Expeditionary Force at their own expense for the purpose of rendering medical aid to the wounded without distinction of race, colour, or creed.—Mr. CURZON replied that the military authorities in Egypt had gladly accepted the assistance of the Red Cross Society for work between Cairo and Assouan. The difficulties of transport, any further call on which would diminish the numbers of the fighting force,

made it impossible, in the opinion of the authorities, to accept any offers of assistance above Assouan.

WEDNESDAY, AUGUST 10TH.

Metropolitan Hospitals and Midwifery Cases.

Mr. ARTHUR O'CONNOR asked the Home Secretary whether he was aware that a poor woman expecting confinement frequently applied to one or other of the general hospitals in London for a doctor to attend her in her confinement, and that frequently in such a case a student was sent to attend who had little or no experience, or might even never have been in a case before, and that no intimation was in such case given to the patient that the person sent was not a fully qualified medical practitioner; and whether the General Medical Council had prohibited the employment by private practitioners of assistants who, although they had taken out a full course of midwifery training, had not taken out a degree in medicine, surgery, and midwifery.—Mr. JESSE COLLINGS replied: The Home Secretary has no information on the subject, but he will communicate with the General Medical Council and make further inquiries so as to ascertain the facts of the case.—Mr. O'CONNOR: May I ask whether besides the inquiries he has promised to make the Home Secretary will further inquire whether among the members of the General Medical Council itself there are gentlemen who are medical officers attached to the hospitals from which these unqualified persons are sometimes sent and whether the Privy Council is in a position to require the General Medical Council to enforce its own regulations for all parties?—Mr. JESSE COLLINGS: There will be a full inquiry made.

PROCEEDINGS ON THE VACCINATION BILL.

HOUSE OF LORDS.

THURSDAY, AUGUST 4TH.

The Vaccination Bill was considered in the House of Lords at this sitting on the order for taking the Committee stage.

The Marquis of AILESBURY moved that the House do resolve itself into Committee on the Bill on this day three months, or, in other words, moved the rejection of the Bill. His lordship complained that the Bill was badly drafted, that it made no allusion to revaccination, that it contained no safeguards, and that it seemed to embody the open-door policy in the matter of small-pox.

Lord LISTER next addressed the House in support of the Bill. A verbatim report of his speech will be found on p. 426.

The Earl of PORTSMOUTH appealed to the Marquis of Ailesbury to withdraw his motion and allow the Bill to be considered in Committee.

Lord HARRIS said he had authority to intimate that the Government were prepared to consider during the recess whether it would not be possible to bring in next session a Bill dealing with revaccination.

The motion of the Marquis of Ailesbury was then negatived without a division and the House went into Committee on the Bill.

The Earl of FEVERSHAM moved to delete Clause 2, the clause dealing with the conscientious objector, arguing that with this clause in the Bill there was no security against small-pox.

Lord ALDENHAM spoke in support of the deletion of the clause.

Lord HARRIS defended the clause on the ground mainly that it embodied a recommendation of the Royal Commission.

Lord LOCH expressed the view that with the new form of lymph the objection to vaccination would disappear.

After a speech from the Marquis of SALISBURY in support of the clause a division was taken, when 40 members voted for the omission of the clause and 38 against that motion. The clause was accordingly removed from the Bill.

FRIDAY, AUGUST 5TH.

When their lordships met to-day they received the amendments made in Committee and read the Bill a third time.

MONDAY, AUGUST 8TH.

At this sitting a message from the House of Commons was read stating that the Commons had disagreed with the Lords' amendment striking out Clause 2, the reasons given being that unless some provision were made for those who conscientiously object to vaccination the enforcement of vaccination would be impracticable in many districts and that the amendment of the Lords was not in the interests of the promotion of vaccination.

Lord HARRIS moved that their lordships do not insist on the amendment.

Lord ROOKWOOD condemned the clause as subversive of good government.

Viscount GALWAY insisted that the Government had given no good reason for the clause.

Lord ZOUCHE advocated the postponement of the Bill until next Session.

Lord STANMORE argued that the Government had power to pass the Bill as they originally proposed it and urged them to exercise their power.

Lord GLENESK, the Earl of FEVERSHAM, Lord ALDENHAM, and the Earl of PORTSMOUTH also spoke against the clause.

The Marquis of SALISBURY then addressed the House. He reviewed the action of the House of Commons on the Bill and spoke at length on the indisposition of many local authorities to enforce the existing law and concluded with these words—viz.:—My lords, I do not look to the effect of this except in one direction; I ask, What effect will it have upon that willing adoption of vaccination which is the only healthy result which you can desire to accomplish? If you pass this Bill now there is nothing whatever, supposing the difficulties about the conscientious objector turn out to be real, to prevent your having another Bill to strengthen what may be thought to be too weak in this Bill. But, at all events, you will have offered an opportunity to those who say your coercion is a mistake and you will have given an experimental trial to those improved processes by which you hope the popular illusion will be dissipated; you will have had a truce and an armistice, the bitterness will have calmed, and the agitation will have gone down, and you will be able to induce local authorities to work with you instead of against you in carrying out this great enterprise for the health and welfare of the people. My lords, I think that the advice which has been given to you under all the circumstances—I do not look beyond that—to kill the Bill is very unwise advice; and for the sake of your own opinion, for the sake of the reform of the law, for the sake of the ultimate achievement of united action upon a matter in which union and concord are essential, you ought to forego the amendment which you only passed by a majority of two three nights ago and allow the Bill to pass into law.

When a division was taken the motion of Lord Harris was carried by 55 to 45 votes. The result is that the clause remains part of the Bill.

HOUSE OF COMMONS.

FRIDAY, AUGUST 5TH.

At a late hour at this sitting the Commons considered the amendments made by the Lords.

Mr. CHAPLIN moved that the House disagree with the Lords in striking out Clause 2, dealing with the conscientious objector.

Mr. GRANT LAWSON expressed his approval of the action taken by the House of Lords in this matter.

Mr. MONK spoke of the clause as practically repealing the Vaccination Acts.

Mr. GRIFFITH-BOSCAWEN recommended the Government to take this opportunity of repairing what he regarded as an unfortunate error.

Mr. CHAPLIN defended the action of the Government saying among other things that the state of opinion in the House of Commons left no other course open to the Government. He predicted that if the Bill were lost there would be a state of things bordering on chaos.

When the division was taken the motion of Mr. Chaplin was carried by 129 to 34 votes.

Accordingly the clause was reinserted in the Bill and a committee was appointed to draw up reasons for disagreeing with the House of Lords.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.

BURGES, F. A. L'ESTRANGE, L.R.C.P.Lond., M.R.C.S., has been appointed Medical Officer for the Handsworth and Great Hampton-street Division of the Post Office.

DOWNMAN, C. F., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health by the Burnham-on-Crouch Urban District Council.

DUNCAN, WILLIAM, M.B., C.M. Glasg., has been appointed Medical Officer of Health for the Clay Cross Urban District, vice Angus Mackintosh, deceased.

FORBES, D. McD., L.R.C.P. F.R.C.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer of Health by the Eastwood Urban District Council.

FRASER, D., M.D. Glasg., F.F.P.S., has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for the Burgh of Paisley.

FREER, J. H., L.R.C.P. Lond., M.R.C.S., has been re-appointed a Medical Officer by the Rugeley Urban District Council.

GRAHAM, T., M.D. Glasg., L.F.P.S., has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for the Burgh of Paisley.

HAYDON, H. W., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Wadebridge Sanitary District of the Bodmin Union.

JONES, T., M.R.C.S. has been appointed Medical Officer for the Middle District of the Whitechapel Union, vice J. Sequeira, resigned.

LEGGE, T. M., M.D., B.Ch. Oxon., D.P.H. Camb., has been appointed Medical Inspector of Factories and Workshops.

LUNAN, C. S., M.B., C.M. Edin., L.R.C.S., has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for the Sheriffdom of Perth.

MASTER, GEO., M.B., B.C. Camb., L.R.C.P. Lond., M.R.C.S., has been appointed an Assistant Medical Officer for the Suffolk General Hospital, Bury St. Edmunds, vice J. S. Hinnell.

OULTON, H. W., M.D. Dubl., L.R.C.S. Irel., has been appointed a Surgeon to the Dublin Metropolitan Police Force, vice T. Nedley.

PARSON, WM., M.R.C.S., has been re-appointed Medical Officer for the Godalming Sanitary District of the Guildford Union.

PLUMMER, H. B. W., M.D. Durh., M.R.C.S., has been appointed an Honorary Consulting Surgeon for the West Bromwich District Hospital, vice H. Sutcliffe, resigned.

ROBERTSON, J. F., M.D. Edin., has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for Shetland.

SHACKEL, G. A., L.R.C.P. Lond., M.R.C.S., has been re-appointed Medical Officer of Health by the Ludlow Rural District Council.

VERNON, C. M., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health for the Ashford Urban Sanitary District.

WHITE, H. E., L.R.C.P. Lond., M.R.C.S., has been appointed an Assistant Medical Officer for the Infirmary of the Parish of Birmingham.

WILLIAMSON, J., M.R.C.S., L.R.C.P., has been appointed a House Physician for the General Infirmary, Leeds.

WILKINSON, GEO., B.A., M.B. Cantab., F.R.C.S., has been appointed an Honorary Surgeon to the Royal Hospital, Sheffield, vice Sinclair White.

WILKS, T. H., M.B., B.C. Camb., L.R.C.P. Lond., M.R.C.S., has been appointed an Honorary Medical Officer for the Sheffield Children's Hospital, vice J. B. Milne, resigned.

Vacancies.

For further Information regarding each vacancy reference should be made to the advertisement (see Index).

BRADFORD CHILDREN'S HOSPITAL.—House Surgeon. Salary £70, with board, residence, and washing.

CARNARVONSHIRE AND ANGLESEY INFIRMARY AND DISPENSARY, Bangor. House Surgeon. Salary £70 per annum, with board and lodging in the house.

CORNWALL COUNTY ASYLUM, Bodmin.—Junior Assistant Medical Officer, unmarried. Salary £100 per annum, increasing £10 yearly to £120 per annum, with board, lodging, washing, and attendance.

COUNTY ASYLUM, Gloucester.—Locum Tenens for about two months. Salary £2 2s. per week and all found (except liquors).

CUMBERLAND AND WESTMORELAND ASYLUM, Carlisle.—Senior Assistant Medical Officer. Salary £120 a year, with board. Applications to Dr. Farquharson, Garlands, Carlisle.

CUMBERLAND INFIRMARY, Carlisle.—Assistant House Surgeon for seven months from Oct. 1st to April 30th. Salary at the rate of £40 per annum, with board, lodging, and washing. Also House Surgeon for one year. Salary £70 per annum, with board, lodging, and washing.

DERBY COUNTY ASYLUM, Derby.—Second Assistant Medical Officer, unmarried. Salary £100 per annum, rising to £120, with board, lodging, and washing.

DEVON COUNTY ASYLUM.—Medical Superintendent. Salary commences at £800 per annum, with other emoluments. No domestic or other servants provided. Applications to the Clerk to the Visiting Committee, 9, Bedford-circus, Exeter.

DEVONSHIRE HOSPITAL, Buxton.—Assistant House Surgeon. Salary £50 per annum, with furnished apartments, board, and washing.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E. — Unqualified Clinical Clerkships, tenable for three months.

GUEST HOSPITAL, Dudley.—Resident Medical Officer. Salary commencing at £100 per annum, increasing by £10 a year to £120 (conditionally), with board, residence, attendance, and washing.

HUDDERSFIELD INFIRMARY.—Senior Assistant House Surgeon. Salary £50 per annum, with board, residence, and washing. Also Junior Assistant House Surgeon. Salary £40 per annum, with board, residence, and washing.

MACCLESFIELD GENERAL INFIRMARY.—Junior House Surgeon. Salary £70 per annum, with board and residence in the institution.

MANCHESTER CLINICAL HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road. — House Surgeon. Salary £80 per annum, with apartments and board.

MILLER HOSPITAL AND ROYAL KENT DISPENSARY, Greenwich-road, S.E.—Resident Medical Officer for six months. Salary at the rate of £30 per annum, with board, attendance, and washing.

NORTH STAFFORDSHIRE INFIRMARY AND EYE HOSPITAL, Hartshill, Stoke-on-Trent.—House Surgeon. Salary £120 per annum, increasing by £10 per year (conditionally), with furnished apartments, board, and washing.

NOTTINGHAM GENERAL DISPENSARY.—Senior Resident Surgeon. Salary £130, increasing to £200 by £10 a year. Subject to boarding arrangements. All other expenses—wages, coal, gas, furnished apartments, &c.—are found by the Institution. Also Clinical Assistant for six months, unmarried. Salary £60 for that period.

OWENS COLLEGE, Manchester.—A Senior and Junior Demonstrator in Physiology. Stipends £150, rising to £200, and £100, rising to £150, respectively.

PARISH COUNCIL OF EVIE AND RENDALL.—Medical Officer. Salary £45 a year and a free house. Apply to the Inspector of Poor, Evie.

POPLAR UNION.—Assistant Medical Officer for the Workhouse. Salary £100, with furnished apartments and rations in the workhouse. High-street, Poplar. Subject to statutory deduction. Applications to the Clerk to the Guardians, Union Offices, 45, Upper North-street, Poplar, E.

ROYAL LANCASTER INFIRMARY.—House Surgeon, unmarried. Salary £80 a year, with residence, board, attendance, and washing.

SOUTHPORT INFIRMARY.—Resident Junior House and Visiting Surgeon for six months. Residence, board, and washing provided, and an honorarium at the rate of £30 per annum will be given.

ST. ANN'S HILL HYDROPATHIC ESTABLISHMENT, County of Cork, Ireland.—Resident Medical Superintendent, married.

ST. MARY'S CHILDREN'S HOSPITAL, Plaistow, E.—Assistant Resident Medical Officer for six months. Salary at the rate of £40 per annum, with board, lodging, and washing.

STOCKTON AND THORNABY HOSPITAL, Stockton-on-Tees. — House Surgeon, non-resident. Salary £200 per annum.

THREE COUNTIES ASYLUM.—Second Assistant Medical Officer, unmarried. Salary commencing at £125 per annum, with board, apartments, washing, and attendance. Applications to the Clerk to the Committee of Visitors, St. Neot's, Hunts.

UNIVERSITY COLLEGE, Bristol, Faculty of Medicine.—Demonstratorship of Physiology. Stipend £125.

WESTERN GENERAL DISPENSARY, Stafford-street, Marylebone-road, London.—House Surgeon, unmarried. Salary £60, with board and residence.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Assistant House Surgeon for six months. Board, lodging, and washing provided, and an honorarium at the rate of £50 per annum will be given.

Births, Marriages, and Deaths.

BIRTHS.

CURRIE.—On Aug. 5th, at Edinburgh, the wife of Oswald James Currie, M.B., M.R.C.S., Maritzburg, Natal, of a son.

GODDARD.—On Aug. 6th, at Pentonville-road, N., the wife of Bertram Goddard, L.R.C.P. Lond., &c., of a son.

HARPER.—On July 29th, at Grosvenor-place, Bath, the wife of J. Maurice Harper, M.R.C.S. Eng., of a daughter (stillborn).

REID.—On Aug. 5th, at Thirlmere, Watford, the wife of A. Lestock Reid, M.R.C.S., L.R.C.P., of a daughter.

STEPHENS.—On July 30th, at The Lindens, Doddington, Cambs, the wife of Cecil Edward Stephens, M.B., of a son.

TINLEY.—On July 28th, at Thorsgrif, Whitby, the wife of W. E. F. Tinley, M.B. Durh., M.R.C.S., of a son.

MARRIAGES.

ATKINSON—EASTMOND.—On Aug. 3rd, at St. John's Cathedral, Hong-Kong, by the Rev. R. F. Cobbold, M.A., John Mitford Atkinson, M.B. Lond., Principal Civil Medical Officer, Hong-Kong, son of the Rev. S. Atkinson, M.A., of Portland, to Clara, eldest daughter of James Eastmond, of Puddyngton, Devonshire.

MACDONALD—STEWART.—On Aug. 8th, at Kenneth-street, Stornoway, Catherine Mary Stewart, daughter of the late John Stewart, of Holm, Stornoway, N.B., to John Smyth Macdonald, B.A. Cantab., L.R.C.P., L.R.C.S., of University College, Dundee, son of George Macdonald, of Chester.

PILLOW—WRIGHT.—On Aug. 10th, at St. Mary Abbott's, Kensington, Henry Pillow, M.D., Pembridge-gardens, W., to Marie Helen Wright, youngest daughter of the late James Wright, Aughantaraghan, co. Armagh.

WARD—JEFFERIES.—On Aug. 4th, at St. Helen's, Ipswich, Francis Ward, M.D., eldest son of Colonel A. E. Ward, late Bengal Staff Corps, to Elizabeth Lilian, second daughter of John Robert Jefferies, J.P., of St. Helen's Lodge, Ipswich.

DEATHS.

ACKLAND.—On Aug. 7th, at Fairhaven, Upper Compton, Plymouth, William Henry Ackland, M.D., J.P., in his 73rd year.

MILTON.—On Aug. 3rd, at Sion House, Chelsea, John Laws Milton, M.R.C.S., of Suffolk-street, Pall-mall.

ROBERTS.—On Aug. 5th, of tubercular meningitis, John Hamilton Roberts, a medical student of Charing-cross Hospital, the only son of J. T. Roberts, L.R.C.P. Edin., 18, Park-road, Crouch-end, in his 20th year.

SMITH.—On Aug. 10th, at "Yew Tree," Tewkesbury, Frederick Henry Smith, M.D., aged 62 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND, WHEN ACCOMPANIED BY BLOCKS, IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1898, which was completed with the issue of June 25th, and the Title-page to the Volume were given in THE LANCET of July 2nd.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1898 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

The rates of subscriptions, post free, either from THE LANCET Offices or from Agents, are:—

FOR THE UNITED KINGDOM.		TO THE COLONIES AND ABROAD.	
One Year	£1 12 6	One Year	£1 14 8
Six Months	0 16 3	Six Months	0 17 4
Three Months	0 8 2	Three Months	0 8 8

Subscriptions (which may commence at any time) are payable in advance.

STERILISATION OF ELASTIC CATHETERS.

IN the current number of the *Deutsche Medicinische Wochenschrift* Dr. Oscar Ehrmann of Mannheim describes two pieces of apparatus which he has devised for the sterilisation of elastic catheters by passing a current of steam through them. He states that for good elastic catheters sterilisation by steam is less injurious than any other equally efficient method, but the apparatus for this purpose described by Posner and Kutner is complicated and costly. He has therefore designed an appliance which may be worked in connexion with any ordinary steriliser. It consists of a boiler provided with several steam jets for insertion into the open ends of the catheters which lie on a perforated tray and are surrounded by the steam filling the closed steriliser so that they are thoroughly exposed to the steam both inside and out. The other apparatus, which is intended for the use of patients, is on the same principle, but is heated by a spirit lamp and takes in only one catheter at a time. The whole of it can be packed into a space 3½ in. high and 2½ in. in diameter. The maker is Mr. Walb of Heidelberg.

ANTI-RHEUM.

A CORRESPONDENT sends us the following circular which he has received and which we think registers a high level of impudence:—

Strictly Confidential.

51, Glasshouse-street, W., 5th August, 1898.

My dear Sir,—We are collecting testimonials from the medical profession for a valuable specific for rheumatism. ANTI-RHEUM has been tried at all stages of this distressing complaint and has in all cases proved an undoubted success. We send you a sample under separate cover.

Testimonials should be sent in before the 12th inst. to secure priority in a special allotment of founders' shares reserved for the faculty. We are, dear Sir, your obedient servants,

STONEFIELD PRATT AND CO.

INSTRUCTIONS FOR USE.

Dissolve in hot water and use as a fomentation.
Packet containing 2 oz. price one shilling.

Our readers will note the suggestion that the medical man should hurry up with his testimonial if he wants to get a special allotment of shares!

AN OPERATION IN A HOSPITAL BY AN UNQUALIFIED PERSON.

THE French press reports a somewhat curious action in the civil courts in which the plaintiff was the father of a child who had been circumcised in a Bordeaux hospital and the defendant the surgeon in whose service the operation was performed. The complaint was that it had been unskilfully carried out, so that "an infirmity" had resulted, and damages were claimed against the surgeon, who, it appeared, had not actually performed the operation himself, but had allowed a person who was not even a medical student to perform it in his presence. This person was a Jewish official, a candidate for the office of circumciser, who had applied to the defendant for a certificate of competency. The defendant had examined him and had seen him operate on the dead body. In addition he arranged to allow him an opportunity of operating on a living child—not a Jew—in the hospital, with the result of landing himself in a somewhat unpleasant position in a court of law. The view of the court was apparently that by delegating his functions as surgeon to an unqualified person who was not even a medical student he had acted illegally. A committee of experts was, however, appointed to examine the child as to the alleged "infirmity."

A WARNING TO MEDICAL MEN.

To the Editors of THE LANCET.

SIRS,—As a protection to the members of the medical profession, I beg to inform your readers that the General Accident Assurance Corporation, Limited, has no agent or person of any kind authorised to appoint medical referees, all such appointments being made by my board and from this office direct. The necessity for this letter has arisen through medical men in Gateshead, Hull, and other towns having written us that a man, or men, giving various names have called upon them offering the appointment of medical referee for our company and taking the medical men's accident proposals, and with them, a deposit, usually £1, and they, the medical men, have heard nothing further of the matter. It seems to me that this is one man who is travelling from town to town under various names, or a gang of men, who are thus victimising the medical men in various towns, and as it appears they have the prospectuses of this company they must have called on our agents or our branch offices, and asked for copies of our prospectuses for purposes of insurance.

I am, Sirs, yours faithfully,

F. NORIE MILLER,
Manager, The General Accident Assurance Corporation, Limited.

Chief Offices, 42 to 44, Tay-street, Perth, N.B.; 115 and 117, Cannon-street, London, E.C., Aug. 3rd, 1898.

"SANOSE."

BY an obvious printer's error this interesting compound was described in our notice last week of the exhibits at the Annual Museum of the British Medical Association as containing 80 per cent. of casein and 120 [per cent. albumose. The last figure should, of course, have read 20 per cent.

IRELAND FUND.

MRS. JOHN IRELAND writes to us from Bourne End, Bucks, to say that she has the pleasure to forward the result of the appeal on behalf of the Misses Ireland with many thanks. Some donations being promised next month she has been asked not to close the list till the end of September so that any sums received up to that time may be added.

	£	s.	d.
Mrs. S. Stanley Brown...	5	0	0
Mr. S. Stanley Brown ...	5	0	0
Miss Jay	5	0	0
Mrs. Rider...	5	0	0
Mr. C. H. Gale...	1	0	0
Mr. E. C. Morley	1	1	0
Mr. W. Shirreffs	1	1	0
Mr. A. de Lande Long...	2	0	0
Per Mr. F. Fenner:—			
Mr. S. le Blanc Smith	2	2	0
Mr. F. G. Gladstanes...	2	2	0
Mr. J. Alcard	1	1	0
Mr. A. C. Stretton ...	2	2	0
Mr. J. Farrell	2	2	0
Mr. F. Fenner	1	1	0
Mr. R. Gale	5	0	0
Mrs. Gale	1	0	0
Mr. F. R. Gale	0	5	0
Misses E. F. Gale ...	0	7	6
Mrs. Bowyer	5	0	0
Misses A. and M. Doughty	0	10	0
Mr. H. N. Custance ...	2	2	0
Mr. C. Outram	1	1	0
Mr. T. Rouse Ebbetts	1	1	0
Mr. C. E. Innes	1	1	0
Miss Davidson	2	0	0
Mr. George Dunnage	1	1	0
Mr. A. Price...	3	3	0
Miss F. Price	1	1	0
Miss A. Price	1	1	0
Per Mrs. Rider—			
Mr. Hayward	5	0	0
Mr. F. P. Rider	1	1	0
Mr. R. S. Rider	0	10	6
A. H.	0	5	0
Mr. G. R. Cox	5	5	0
Mr. W. Dunnage ...	1	1	0
The Proprietors of THE LANCET	5	5	0
Mr. C. Tacy	5	0	0
Dr. T. D. Savill	1	1	0
Mr. A. Hodgson	1	1	0
Mr. W. Stout	1	1	0
Per Miss A. Doughty ...	2	7	0
Mr. E. D. Brickwood ...	2	2	0
Per Mr. J. L. Jones:—			
Mr. Chant	1	0	0
Mr. Fiddon	0	5	0
Mr. Caink	0	5	0
Mr. Reeve	0	5	0
Mr. Smithson	0	5	0
Per Mr. E. D. Brickwood:—			
H. S.	2	2	0
Per Mrs. Rider:—			
Mr. Pepkin	1	1	0
Mr. T. F. Rider	5	0	0
Miss Jay (second donation)...	50	0	0
H. B.	2	0	0
W. S. D.	5	0	0
Mr. J. D. Harrison... ...	5	0	0
Mrs. Kimpton	0	2	6
Per Mr. and Mrs. Stanley Brown:—			
General and Mrs. Parsons	1	1	0
Captain C. Parsons ...	2	0	0
Mrs. Round	1	0	0
Mr. Domett Stone ...	1	1	0
Mr. H. Chapman ...	5	5	0
Mr. L. Salomons... ...	5	5	0
Mr. R. Milburn	5	5	0
Mr. C. T. Room	5	5	0
Mr. P. H. Waterlow ...	2	2	0
Mr. H. W. Maynard ...	2	0	0
Dr. Goddard...	2	2	0
Per Miss Elsden	1	0	0
Mr. John Elsden ...	1	0	0
Anonymous	2	15	0

WANTED A HANDBOOK ON HYPNOTISM.

To the Editors of THE LANCET.

SIRS,—I should feel obliged if any of your readers could recommend a good work on Hypnotism, one giving practical details as to the production of the hypnotic state would be preferred.

I am, Sirs, yours faithfully,

Aug. 7th, 1898. INQUIRER.

J. D. S.—A correspondent who has personal knowledge of Port Erin and Port St. Mary (Isle of Man) informs us that they are naturally both very healthy towns. They both belong to the peninsular parish of Rushen. Port Erin looks straight towards the west (having Ireland, in the shape of the Mourne mountains, in front of it), whilst Port St. Mary looks out on the sea towards the east mainly, but a large portion of the best new part looks to the south-west over the bay. The populations of these two towns would dominate the death- and birth-rates of the parish of Rushen in which they lie. During 1896, according to the last annual report of the Manx Registrar-General (the one for 1897 will now soon be published), the death-rate for the Isle of Man was 19·2 per 1000 and that for Rushen 19·6. In his inaugural address on Medical Geography, delivered before the Isle of Man Medical Society, and published in THE LANCET of July 31st, 1897, Mr. Alfred Haviland stated that the phthisical death-rate of the island is higher than that of England and Wales. At certain times of the year, when the equatorial winds are strong, phthisical cases cannot stand the Rushen coast and soon fall victims. The water-supply is good in both towns, coming from springs on elevated moorland. In 1896 only two deaths from zymotic disease (one from scarlet fever and one from measles) were registered in Rushen. It must be remembered that the sanitary regulations in the Isle of Man are very different from what they are in England. An Act for notifying disease is in operation and there is an isolation hospital about two miles from Douglas. Aberystwith can be recommended as a health resort.

Medical Referee.—It is undesirable that a medical referee should attend anyone whose case may hereafter come before him in his capacity as medical referee. This ruling, however, would not apply in the case of a patient treated in a hospital gratuitously by a medical officer of the hospital who also may be a medical referee.

S. H. S.—For full information see numerous articles in our columns. Consult the index of vol. 1 of THE LANCET for the current year. THE LANCET of April 23rd, 1898, contains the official memorandum of the Home Office on the subject.

Acute Sufferer should consult his medical man.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (15th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M., Ophthalmic 1.15 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), St. Mark's (9.30 A.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), Westminster (2 P.M.), London Throat Hospital (2 P.M.).

TUESDAY (16th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M. and 6 P.M.).

WEDNESDAY (17th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M.).

THURSDAY (18th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex, (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M.).

FRIDAY (19th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat Hospital (2 P.M. and 6 P.M.).

SATURDAY (20th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Cancer (2 P.M.), London Throat Hospital (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 11th, 1898.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radia in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
Aug. 5	29·99	S.W.	...	120	76	58	59	62	Cloudy
,, 6	29·80	S.W.	0·02	82	70	61	64	66	Overcast
,, 7	29·83	N.E.	0·78	68	57	55	53	56	Raining
,, 8	29·72	E.	...	87	62	51	53	55	Raining
,, 9	30·04	N.	...	108	70	52	54	58	Cloudy
,, 10	30·15	S.W.	...	87	68	54	56	60	Cloudy
,, 11	30·21	W.	...	116	76	60	60	63	Cloudy

During the week marked copies of the following newspapers have been received: *Glasgow Herald, Huddersfield Chronicle, Newcastle Chronicle, Sheffield Telegraph, Lancashire Express, Colchester Mercury, Builder, Warwick Times, Pioneer Mail, Times of India, Western Morning News, Architect, Scotsman, Citizen, Worcester Echo, Eastern Morning News, Dundee Advertiser, Leeds Mercury, South Wales Daily News, Sussex Daily News, Liverpool Daily Post, Malvern Advertiser, Bedford Standard, Southern Times, Birmingham Post, Manchester Guardian, Kidderminster Shuttle, Bury Free Press, Bradford Mercury, Bristol Mercury, Morning Leader, Hampshire Independent, Portsmouth Times, Yorkshire Post, Brighton Gazette, Sanitary Record, Montgomery Express, Nottingham Daily Guardian, Nature, Madras Times, Caterham Free Press, Public Health Inquirer, Science Siftings, Family Doctor, Wheels, Hertfordshire Mercury, City Press, Mining Journal, Local Government Chronicle, Reading Mercury, Observer and Chronicle (Bournemouth), Surrey Advertiser, Admiralty and Horse Guards Gazette, Westminster Gazette, The Morning, Ceylon Standard, Fife Herald, Kelso Mail, East Kent Times, Epsom Herald, Isle of Ely Advertiser, Sunday Chronicle (Manchester), Torquay Times, Craven Herald, &c., &c.*

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